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F.R. Fosberg

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Field and Collection Note Book

No. 42

(June 4, 1956 - June 24, 1956)

(3736) -- (3736)

RYUKYU ISLANDS

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# Field and Collection Note Book

No. 45

(June 4, 1956 - June 24, 1956)

(37262 -- 37736)

## RYUKYU ISLANDS

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Ishigaki  
Taketomi



Ishigaki

1

June 4 - above Inota

(40) (Photo 955-54)

Secondary scrubby forest,  
dense, full canopy,  
lianas abundant  
esp. Flagellaria + Smilax.  
Trees mainly secondary  
species - Ficus, Macaranga,  
Mallotus, Diospyros,  
Cannellia, Ardisia,  
Schefflera, Trema.

Undergrowth of Psychotria, <sup>Lasiacanthus</sup>  
and abundant ferns,  
Angiopteris, Tectaria,  
Polypodium, etc.  
especially in gulches.  
Arenga common.

Leeches abundant on  
dead sticks & leaves  
on ground.



(4) (Photo 950-54)

Dense forest of small trees not over 10 m. tall.

Quercus, Ficus, etc.

~~Antis~~ Rhub layer very marked. *Lasianthus*, *Psychotria*, *Ardisia*, *Myrsine*

*Sarcandra* ~~various~~ *Antidesma*, various other sterile shrubs; ~~the~~ about 2 m. tall, stems average 3-5 m. apart. Trees 2-5 m. apart.

Few ferns, few lianes. Some Zingiberaceae. Almost no other ground cover.

Dead leaves over bare soil general. A few seedlings.

Much logging going on here, even of trees down to 10 cm. dbh. No obvious preference of species - *Styrag*, ~~Lauraceae~~, *Lauraceae*, etc. as well as *Quercus*, *Elaeocarpus*, etc.

Locally there are patches of several ferns, apparently spreading by running rhizomes, also of *Alpinia* sp.

But even where there is a slight gully or steep slope the fern ground cover becomes very abundant.

A few *Asplenium* ridges on tree trunks, otherwise epiphytes confined to a few crustose lichens, algae, etc. one small fern.

But several close clinging vines, incl. *Psychotria serpens*, and one or two others are quite common running up into trees.

Tree trunks here quite commonly up to 3 dm. dbh., occasionally larger.

Additional trees in top layer *Ardisia*, *Elaeocarpus*, *Myrsine*.

*Ficus* not abundant on ridge tops.



1954

(42)

Deep gulch with small stream, huge boulders and some alluvium in bottom.

Trees here are 15 m. or even more tall, many kinds incl. Ficus, Libotium,

Ferns very abundant and many kinds angiopteris and a small tree fern-like sterile species, a big Polypodium, Thelypteris, Oxypteris, etc.

Arenca common, also a big araceous vine and what looks like a Hoya but non-lactiferous, climbing on rocks. Mosquitoes in great numbers (Aedes)



1956 Ryukyu Is.

Inoda Yama, <sup>W of m.</sup>  
June 4 - 1-1.5 km. 60° W. of N. of  
~~Inoda~~ Inodadeep wet <sup>wooded</sup> gulch

37262

3

~~Polypodium~~ <sup>Tectaria decurva (Pres) Copel.</sup>  
common on steep banks  
~~near~~ along bottom of ~~deep~~ gulch

6

63

~~Psychotria~~ <sup>Ophiophila liukiuensis Hayata</sup>

occasional in bottom of

5

64

Psychotria <sup>liukiuensis Hatusima?</sup>

occasional in bottom of

4

65

Ficus <sup>ampelas Burm. f.</sup>

common in

on rounded wooded ridge

1

66

Ardisia <sup>quinquegona Bl.</sup>

common

7

67

Ardisia <sup>quinquegona Bl.</sup>

common

6

68

Ilex mutchagana Mak.

~~one tree seen~~ <sup>I. mutchagana</sup>

1

69

Ardisia sieboldii Mig.?

5

70

(few) <sup>Lemmaphyllum microphyllum Presl</sup>

epiphytic on tree-trunks.

71

Lasianthus <sup>tashiroi var. pubescens</sup>

rare

ISHIGAKI ISLAND.

100-150 m.

"bird's nest" habit, sterile  
fronds spreading and  
ascending, fertile ones  
more erect.

shrub 0.7 m. tall;

flowers white.

shrub 1.5 m. tall,

flowers whitish

65 tree 15 m. tall, 20 cm. d.b.h.  
somewhat buttressed.

200 m.

66

shrub 2 m. tall;

fruit immature

67

shrub 2-3 m. tall;

very young fruit red.

68

tree about 10 m. tall,

cut for timber, log  
about 15 cm. thick; flowers  
white.OK  
EHW

69

shrub 1.5 m. tall.

flowers pinkish white,

anthers turning very

dark in age, punctate

when young and pinkish.

70

vine clinging

very closely to tree-trunk.

(Matsum.)

71

small shrub;

Naka: veins glossy above.



37272 *Ilex goshiensis* Hayata  
one tree seen

3 73 *Korthalsella opuntia* (Thunb.) Merr.  
parasitic on #37272

5 74 *Quercus cuspidata* Thunb. (Thunb.) Schott  
common

5 75 *Elaeocarpus japonicus* S. & Z.  
common

6 76 *Daphniphyllum*? *Distylium racemosum* S. & Z.  
occasional

5 77 *Dryopteris varia* (L.) Oakes.  
common, especially in small ravines and depressions

5 78 *Cyclosorus triphyllus* (Sw.) Copel.  
very common in patches, especially on slopes and in depressions, terrestrial

5 79 *Alpinia chinensis* (Willd.) Roscoe  
common

5 80 *Styrax japonica*  
rare

5 81 *Randia*  
occasional

tree about 10 m. tall,  
cut for timber; inflorescence  
~~from~~ appear abnormal.

OK dark green, branchlets  
flattened perpendicularly  
to ~~branch~~ plane of  
flattening of branches,  
but basal joint of a  
branchlet often terete.

tree 10 or 12 m. tall,  
cut for timber; leaves  
bronze beneath,  
fruit immature.

OK tree 10 m. tall, cut for  
timber, a few leaves  
red; fruit immature.  
76 Tree 10 m., cut for timber.

Terrestrial

78 running rhizomes  
forming patches.

19 ~~stems~~ rhizome horizontal,  
aromatic when broken;  
flowers white, lip with  
2 deep pink stripes.

80 tree 8 m. tall 12 cm. dbh.  
cut for timber.

81 shrub 2 m. tall,  
flowers white.



- same *Syzygium buxifolium* H. & A.
- 37282 *Eugenia microphylla* Abel  
occasional
- 5 83 *Ardisia quinquegona* Bl.  
common
- 5 84 *Psychotria* *P. rubra* Poir.?  
very common, making up  
a large part of shrub layer
- 3 85 (orchid) *Stereosandra koidzumiana* Ohwi (? =  
very local, one colony seen
- 5 86 *Psychotria serpens* L.  
common, climbing in  
trees
- 5 87 (~~laurel~~) *Daphniphyllum teijsmannii* (Vance  
occasional
- 5 88 (~~fern~~) *Homogramma decurrens* (Hook.) Copel.  
~~rare~~ rare in small draw
- 2 89 *Callicarpa innotensis* Masam.  
occasional in ravine
- 2 90 (~~laurel~~) *Machilus thunbergii* S. & Z.  
occasional
- 7 91 *Myrsine sequeirii* Lévl.  
common
- 5 92 *Ilex goshiensis* Hayata  
occasional
- 2 93 *Antidesma*  
occasional
- 5 94 *Ilex goshiensis* Hayata  
occasional

150-175 m.

- shrub 2 m. tall,  
flowers with white stamens.
- shrub 2.5 m. tall;  
fruit immature
- shrub 2 m. tall; flowers  
greenish.
- S. javanica* (Bl.)  
det. L.A. Garay erect, stems whitish  
from a fleshy tuber; flower  
parts purple-tipped.
- OK young vines, very  
closely appressed to  
tree-trunk, growing up  
from ground. ramifying  
in upper branches of  
trees; flowers pale greenish.
- Shimawana*  
Harmsawa? tree 6 m. tall, fruit  
immature.
- det. H. H.  
Moldenke 89 shrub 2 m. tall,  
fruit immature.
- 90 small tree, sterile;  
leaves glaucous beneath.
- 91 tree 8 m. tall; fruit  
immature
- 92 small tree,  
fruit immature
- 93 shrub 1.5 m. tall,  
fruit immature.
- 94 small tree,  
fruit immature



37295 Dendropanax

3

in deep wet wooded gulch

1 96 ~~from~~ *Bolbitis subcordata* (Lepel) Ching  
rare1 97 *Trichomanes javanicum* (Bl.) van der Bosch  
local, on vertical clay bank2 98 *Asplenium unilaterale* Lam.  
local, on vertical clay bank3 99 *Randia?* *R. canthioides* Champ.  
occasionalJune 5 - south of base  
of Maishi Take(43) Chert outcrop in semi  
cultivated area. Has  
been burned over not  
too long ago.Between the chert boulders  
are areas of grass - partly  
*Imperata*, partly *Paspalum*,  
*Andropogon*, etc.On the rocks is a  
scrubby woody vegetation  
of *Ficus*, *Toddalia*, *Mallotus*,  
*Euphorbia* (?), *Melia*, *Psidium*,  
*Boehmeria*, *Pongamia*?,  
*Arenca*, andone or two other shrubs,  
clumps of *Miscanthus*,  
and *Polypodium*,  
*Scelopendria* and  
*Nephrolepis*, *Dianella*

96 fertile fronds erect

97 dark green.

99 small tree or large shrub,  
fruit immature.Tangled in this are  
*Vitis*, *Ampelopsis*, *Smilax*,  
*Bauhinia*, *Alysicarpus*?  
*Pueraria*, *Lygodium*,  
a thorny trifoliate vine,  
and *Hoya*.Some *Rubus*, *Cyperus*,  
*Thelypteris*, *Lilium*  
*longiflorum*, *Pittosporum*,  
*Lauraceae*?, *Rosa*,  
and *Agave americana*.  
*Munaya*, *Pumila*, *Carmona*,  
*Oxalis*, *Kimilia*,  
*Leucaea*, *Setaria*, (Melast.? )  
*Gynura*, *Conyza*, *Paspalum*,  
*Wahlenbergia*, *Andropogon*,  
*Artemisia*.Peppery fields abandoned  
or fallow - pure stands  
of *Caribaea*.



1956

June 5 - Chert Hills  
above Water works.

(44) Unburned chert  
outcrops.

Few species noted  
here that were not  
on the burned hills -  
*Polygala*, *Viola*,  
*Polypodium thunbergii*,  
*Psychotria serpens*,  
*Vernonia cinerea*,  
*Nephrolepis exaltata*,  
but everything is  
much more luxuriant.  
Less weeds, grass thicker  
around base.

Abandoned or fallow  
paddy fields nearby  
are covered by a pure  
stand of *Panicum*.

Well up the slope *Dendro-  
panax*, then *Quercus*, come  
in. *Podocarpus* general  
but only saplings.



(June 5 - just south of  
base of Maishi Take)

small hill of chert,  
with bare rocks and  
bushy vegetation.

- 37300 *Polygala* <sup>*japonica* Hook.</sup>  
in rock crevices  
1 01 *Viola*  
at base of rock face  
3 02 *Polypodium Thunbergianum*  
in crevices on rock face

same - roadside

- 2 03 *Echinochloa* <sup>*hi-pedula* (Retz.) Keng det. A. Chase</sup>  
in thick grass  
5 04 *Vitex* <sup>*trifolia* var. *heterophylla* (Mak.)</sup>  
on steep bank  
7 05 *Ficus* <sup>*erecta* Thunb.</sup>  
on steep bank

June 5 - 1 km. s.s.e. Maishi Take

roadside thicket

- 5 06 *Ficus* <sup>*septica* Burm. f.</sup>  
common  
5 07 *Acacia confusa* Merr.  
abundant, probably planted  
along shallow ravine  
3 08 *Cerbera manghas* L.  
common

80 m.

*Pleopeltis thunbergiana* Kaulf.

17 October

- 04 shrub 1.5 m. tall,  
flowers violet.  
05 shrub 2.5 m. tall,  
ripe figs red, mostly  
immature.

40 m.

- 06 low bushy tree 6 m. tall,  
figs immature.  
OK 07 low tree 3 m. tall (others  
to 6 m.), trunk crooked,  
flowers yellow, fruit immature.  
08 small tree, flowers  
white, center red, calyx  
pale green, tube slightly  
dilated only near top.



same - small  
chert outcrop with  
some soil.

37309 *Conyza* <sup>var. *diversa* (L.) Less.</sup>  
5 common on soil

5 10 *Ernia souchifolia* (L.) DC.  
common on soil

5 11 *Cyperus* <sup>*distans* L. f. OK 1 H. Kern</sup>  
common on soil

5 12 *Ficus* <sup>*superba* var. *japonica* Miq.</sup>  
very common

1 13 (grass) *Pectis glabra* (Roth.) A. Camer  
rare

6 14 *Ampelopsis* <sup>*brevipedunculata* (var.)</sup>  
very common climbing  
on rocks and bushes

5 15 *Mallotus* <sup>*japonicus* Miq. A.</sup>  
common on rocks

3 16 *Nephrolepis* <sup>*biserrata* (Sw.) Schott</sup>  
common on rocks

5 17 *Polypodium scolopendria*  
common on rocks <sup>*Milloniana*</sup>

3 18 *Polypodium scolopendria* Braun.f.  
common around base of rocks

5 19 *Erodia* <sup>*Fagaria nitida* Roth (= *Xanthoxylum*)</sup>  
common clambering over rocks

2 20 *Hoya carnosca* (L.) R. Br.  
common, climbing on  
rocks.

45 m.

erect

10 base of stem purplish.  
flowers purple, little  
exceeding involucre.

11 erect culms scattered,  
solitary

12 shrub 2 m. tall,  
mostly sterile at this season.

13 erect, one fertile culm,  
several tillers.

14 vine, flowers greenish,  
petals very caducous,  
fruit blue when ripe,  
mostly immature.

15 shrub 1-1.5 m. tall,  
leaves green beneath  
except when very young  
fronds plane, leathery,  
pendent

16 probably same as #37318  
but dwarfed by unfavorable  
habitat.

17 fronds erect

18 scrambling shrub,  
strong odor when broken.

19 prostrate vine, leaves  
very fleshy, flowers white  
with red center, waxy-fleshy.



37321 (Apr.) *Trachelospermum asiaticum* Nakai  
common on rocks

3 22 *Raphiolepis chinensis* (Koidz.) Nakai  
common on rocks

5 23 *Bauhinia japonica* Maxim.  
local on rocks

same - weedy cultivated  
sweet-potato patch.

1 24 *Euphorbia hirta* L.  
occasional

5 25 *Setaria verticillata* (L.) Beauv.  
rare

3 26 *Daucus carota* L.  
occasional

2 27 *Digitaria chinensis*  
occasional *violascens* Link.

3 28 ~~Mentha~~ *Orthodon scaber* (Thunb.) H. & M. ?  
occasional

5 29 *Ranunculus sieboldii* Miqu.  
common

5 30 *Digitaria ~~pestinata~~*  
common *virginiana* (L.) Scop.  
leafy stalks?

scandent or semi-scandent  
shrub, lactiferous, mostly  
sterile.

erect shrub  $\pm$  1-1.5 m.  
tall, fruit immature.

scandent shrub,  
flowers pale yellow.

40 m.

OK

purplish

del A.  
close

spreading, caespitose

OK 3 NW

erect, flowers white

culms spreading

del A.  
close

fragrant when  
broken; flowers pale lavender.  
stoloniferous; petals yellow

del A.  
close

culms spreading,  
rooting at nodes,  
scapes somewhat ascending



1956 Ryukyu Is.

mts. 1-2 km. sw.  
June 4 1st of Kabira

(nos. 45-62 on photo 950-65)

- (45) Lower slopes mixed small pine and various secondary shrubs and small trees. In more open places *Miscanthus* is common but not very dense. Much *Pteridium*, *Elephantopus* molles.

- (46) Pines become thicker, especially saplings, upward. When sharp ridge is reached, of granitic boulders, the n.w. side is covered by a scrub forest 3-4 m tall of slender trees of various kinds.

(47) On ridge itself the same, with some cycads, pine, Pandanus. On other side, pines. much *Ficus*

- (48) Ridge with tangled low vegetation - pines, *Ficus*, etc. difficult to traverse even constantly using machete. Much *Lygodium*, some *Miscanthus*

Small yellow jacket nest. The insects do not seem to be bothersome until the tree the nest is on is touched. Then sting viciously. (hadzi Y) (hadzi J) Usually 2-3 wasps on nest (see diary). Mosquitoes present on ridge, rather aggressive. A small black species, also an *Aedes*. Possibly breeds in *Pandanus* axils.

Most common tree in broadleaf scrub forest is pinnate leaved one with 3 follicles. Stinging caterpillar "yamagi" said to like this tree.

- 49 Upward on n.w. slope, scrub forest gets a bit taller, perhaps ~~to~~ 5 m. canopy dense. Shrub layer fairly well developed, almost nothing on ground, a few ferns + sedges + seedlings. Can be walked thru with little use of machete in places.

*varicosa*  
*spicata*  
rare  
now.



"Yamagi" seen on  
*Cinnamomum* rather  
 surrounds twig, is  
 brown, & rows of black  
 and yellow specks on  
 back, sparse short  
 black bristles, longer  
 stiff bristles pointing  
 downward on legs,  
 seeming to help cling  
 to twig.

50 In very rocky ground  
 stature of scrub is lower  
*Eurya*, *Eugenia*, other  
 arborescent lft. plants  
 more prominent.

49 Near top <sup>side ridges</sup> ~~stature~~  
 becomes lower scrub  
 thicker, 2-4 m. tall.  
 trunks 2-5 cm. thick.

51 Taller & larger trees  
 in shallow draws.

200 m.  
 52 On first main top the  
 vegetation is a dense  
 scrub about 4 m. tall.  
 Many species, including  
*Myrsine* (a *Ternstroemia*)  
*Ficus*, *Dendropanax*,

*Cinnamomum*, *Eurya*,  
*Eugenia*, *Claoxylon*, etc.

53

On broad flat ridge  
 west from this is a  
 forest 5-7 m. tall, trees  
 up to 20 (-rarely 30) cm., mostly  
 up to 10 cm. full canopy,  
 sparse shrub layer,  
 many species of trees  
 + shrubs. *Garcinia* *spicata*  
 rare here. Trees 1-1.5 m.

apart. Some lianes.  
*Flagellaria*, *Burkea*, etc.  
 Ferns fairly abundant  
 on ground.

In places the forest is  
 largely *Ficus*, *Elaeocarpus*  
 ( spp.), several *Sauraceae*,  
*Camellia*,  
 in other places largely  
*Quercus* *cuspidata*.

at about 200 m. or a  
 little higher, *Pleuroblastus*  
 comes in, at first  
 mixed with forest,  
~~etc~~ then forming  
 almost pure brakes.  
 A few old pines scattered  
 around edges and on  
 ridges in these brakes.  
 Canes finger size or smaller,  
 orange to greenish.

54



Clump forming but also with underground horizontal rhizomes, clumps coming from side branches from these, single culms also. Blade of culm sheaths appressed and divergent on same culm.

These brakes are about 4 m. tall. They occur in patches on the ~~n.e.~~ sides of the high crests, but the highest peak has none, but is wooded all over. On high crests the brakes are lower in stature, 1.5 - 2 m.

(55) ~~58~~

(56)

In the canyon behind Kabira are patches of bamboo down to 1500 m or even lower. No pattern to distribution except that they are on ridges separated by wooded ravines. All have a few spreading umbrella-shaped pines.

Some low scrub in with bamboo near crests.

(59)

Main ridge to west seems to have better forest, but trees very gnarled and spreading.

57

In saddle the forest is about 10 m. high, trees up to 15-20 cm. dbh. many of them clusters of stump sprouts. Canopy full, but not dense, shrub layer well developed. Main canopy largely oak. Ilex forms a loose second story. Little on ground - a few ferns, terrestrial orchids, sedges, *Ligularia* etc.

(58)

(59)

In main draw leading up to west ridge and on ridge, itself, mentioned above, trees to 15 m. and 3 dm. dbh. Many ferns on ground. Dense canopy. Beeches in bottom of ravine. Well developed shrub layer. Many species of trees, esp *Quercus* + *Elavocarpus*. One tree seen 5-6 dm. dbh. 15-18 m. tall.



60

~~upper part of~~ at head of small  
~~mouth~~ ridge of valley  
has thick forest  
about 6-8 dm. tall.

Many spp. incl.

*Dendropanax*, *Ydessa*,  
etc. Tangled with

*Freycinetia*, *Smilax*,  
*Clasagrus*, *Flagellaria*, etc.

61

Slope of ~~ridge~~ <sup>valley</sup> not  
far from mouth - dense  
forest about 8-10 m.

High trees mostly  
small, 10-15 m. dbh.

occasional large  
*Ficus* with compound  
trunk.

Lianas, incl. *Entada*,  
abundant. Many  
ferns. shrub layer  
very sparse.  
Some *Alocasia*.

62

Near the bottom  
of the valley *Ficus*  
becomes abundant.

*Maesa* and *Alocasia*  
common. Secondary  
species, as *Mallotys*  
become dominant.

Vines, esp. *Flagellaria*  
become more abundant.



1956 Is Ryukyu Is.

June 6 - about 1 km. s.w. of Kabira  
in steep trail in semi-open vegetation

37331 *Mitrasacme pygmaea* R. B.  
very local

37331 a *Diglossa pruriens* (Thunb.) Buse  
in scrub forest on steep slope

2 32 *Citrus depressa* Hayata?  
wild

1 33 *Ligularia tussilaginea* (Burm. f.) Makino det Walther 1974  
*Farfugium tussilagines*  
common *F. japonicum* (L.) Kitam.

2 34 *Cinnamomum*?  
common *C. japonicum* Sieb. & Zucc.

ridge east of ~~Mae~~ Mae Take  
June 6 - 1.5-2 km. s.w. of Kabira  
on high wooded ridge

1 35 *Ardisia cuneata* Sims  
occasional

2 36 (Lam.) *Machilus thunbergii* S. & Z.  
occasional ~~in~~

5 37 *Elaeocarpus japonicus* S. & Z.  
common ~~in~~

5 38 *Ficus erecta* Thunb.  
~~common~~ occasional

5 39 *Elaeocarpus sylvestris* (Lam.) var.  
common *ellipticus* (Thunb.) Hance

1 40 *Pleuroblastus lindleyi* (Munro) Nakai  
locally abundant on high crests and on patches on north slopes.

40 m.

flowers white

det. A  
claw

100 m.

slender ~~shrub~~ small tree, 3-4 m. tall, fruit very immature.

125 m.

sterile "yama-gobo" (?)

34

sterile shrub, host for brown "yamagi" or stinging caterpillar. "shiro tabi"

200 m.

35

small slender shrub 0.8 m. tall; fruit immature.

36

small tree, sterile. "aka tabi", bark used for "okinawa incense".

det.

37

tree 5 m. tall; fruit immature.

38

small slender tree 4 m. tall.

39

tree 3 m. tall.

det. F. A.

*Machilus* (primarily)

culm

sheath

blade

divergent

on same culm

forming dense brakes 2-4 m. tall, canes greenish to orange, in clumps or solitary, clumps and solitary canes from branches, bottom of running rhizome;



- 37341 *Adiantum* *flabellulatum* L.  
 ✓ common, terrestrial
- ✓ 42 ~~*Adiantum*~~ *Lindsaea* *communis* Tagawa  
 occasional, terrestrial
- 7 43 ~~sub~~ *Trichomanes* *dubia* (Lindb.) Oakes  
 occasional
- 44 *Dendropanax*  
 common

petioles black

petioles green

tree 8m. tall (others seen taller)  
 fruit immature, seeds in cell.  
 tree 3 m. tall, flowers  
 green.



June 7 - above Yachihara  
(nos. on Photo 950-113)

- (63) Forest in lower part of canyon above water  
of *Ficus*, *Mallotus*,  
*Andisia*, *Diplospora*,  
*Cyathea*, *Quercus*,  
*Wendlandia*, *Schefflera*,  
tangled undergrowth  
of *Arenca*, large  
ferns, diaceous vines  
*Caesalpinia*, shrubs,  
etc.

- (64) At about 100 m. on the  
east wall of the gulch  
*Quercus* becomes dominant  
forming a loose forest  
10 m or so tall with thin  
undergrowth. *Cyathea*,  
*Clacocarpus*, *Andisia*,  
etc. also common.  
Terrestrial ferns,  
*Blechnum*, etc. common.  
On some gentler slopes  
a complete undergrowth  
of the diminutive tree  
fern. trunk 2 m. or less,  
fronds to 2 m. or more. Sections  
of trunk used as bases  
for house plants.

- (65) On a ridge coming  
down to west of this gulch  
*Quercus* is dominant  
in a drier type of forest  
10-12 m. tall.  
A distinct second story  
5-8 m. tall formed of  
*Andisia*, *Diplospora*,  
*Eugenia*, etc.  
A dense layer of  
*Psychotria*, *Lasiacanthus*,  
*Artidesmos*, small  
*Cyathea*, *Eugenia*,  
*Angiopteris* etc.

Ground cover sparse,  
of ferns, seedlings,  
*Alpinia*, broad leafed  
grass, etc.

Some *Smilax* but  
leaves not prominent.

- (66) Upward forest becomes more  
diversified. *Freycinetia*  
common. Some epiphytic  
*Asplenium nidus*.  
"Sada-mushiru" a "haru-mushiru"  
young fronds eaten, cooked,  
at time incense is burned.  
Cooked fronds have an odor  
much appreciated by  
older men & women. Not  
eaten much now.



- (67) On level ridges at higher altitudes the trees reach 15 m. tall and 5 dm. dbh. Mostly 3-4 dm. or smaller. *Quercus* most abundant but many others. thick shrub layer about 2 m. *Psychotria*, *Antidesma*, *Schefflera*, etc. a few small bunches of *Pleioblastus*.

- (68) Near summit stature of trees becomes lower. ferns both terrestrial and epiphytic become more abundant. Bamboos become more abundant. Tree trunks 2-3 dm. dbh.

- (69) At summit is a patch of bamboo with only a few scattered stunted trees. The patch is on the north side. Oaks and small lauraceae are most common trees around summit.

Bamboo is about 4 m. tall.

- (70) Next mountain eastward is much higher, and has a very large patch of bamboo, with low forest in shallow ravines.

- (69) The bamboo here seems identical in every respect with that on Kabira Mts.



1956 Ryukyu Is.

June 7 - <sup>mountain</sup> ridge about  
Yoshihara Villagein thick wet woods  
near summit

- 37345 *Polypodium thunbergianum*  
occasional, epiphytic  
well up on tree trunks.
- 5 46 *Elaphoglossum*  
large colony on shaded rocks
- 6 47 *Neolitsea* <sup>*doosterlinia* Engl.</sup> *cinnamomum*  
common around edges  
of bamboo brake
- 1 48 *Raphiolepis*? <sup>*linkiaensis* (Koidz.) Nakai</sup>  
common in edges of  
bamboo brake
- 2 49 *Podocarpus macrophyllus* (Thunb.) D. Don  
occasional in understory,  
(not forming a
- 6 50 *Neolitsea* <sup>N. *hoshikii* det. C.K. Allen</sup> *sericea* (Bl.) Koidz.?  
occasional in canopy layer
- 6 51 *Ardisia* <sup>*quinquegona* Bl.</sup>  
common
- 6 52 *Ilex* <sup>*goshikiensis* Hayata</sup>  
occasional
- 6 53 *Dioscorea* <sup>*Randia* *canthioides* Champ.</sup>  
common
- 5 54 *Randia*  
occasional
- 5 55 *Eurycnus* <sup>*luteo-venosus* T. Ito</sup>  
rare
- 6 56 *Antidesma* <sup>*japonica* S. & Z.</sup>  
common in undergrowth
- 5 57 *Scleria* <sup>*terrestris* (L.) Fernald</sup>  
occasional

400 m.

*Pleopeltis thunbergiana* Kaulf.

- cheimophylla bicuspis* (Bl.) Presl  
sterile fronds mostly  
curved downward.
- 48 small tree, 5 m. tall,  
ends of branches  
bunchy, compact.
- 48 small tree 4 m. tall;  
fruit immature.
- 49 sapling 2 m. tall,  
sterile (no mature trees seen)
- 50 tree 10 m. tall; fruit  
immature.
- 51 small tree very young  
fruits pinkish.
- 52 small tree; fruit immature.
- 53 tree 8 m. tall; fruit  
immature.
- 54 small tree; bud only.
- 55 small shrub, stems  
green.
- 56 small shrub, fruit  
immature.
- 57 caespitose



same - high wooded ridge  
 37353 ~~Styax~~ *Adiantum yagajirum* Ohwi  
 5 ~~very~~ rare

2 59 ~~Vaccinium?~~ *Cuscuta latifolia* Ito  
 rare

3 60 ~~Polygodium~~  
 occasional on mossy boulders

6 61 ~~Cinnamomum?~~  
 occasional *Styrax japonica* Sieb. & Z. 17

same - wooded ridge  
 3 62 *Lasianthus*? *L. takinoi* var. *pubescens*  
 rare

2 63 *Andisia* *quadrangula* Bl.  
 common

4 64 *Lasianthus* *cyaneus* Turcz.  
 occasional

5 65 *Cinnamomum* *lanceolatum* Engl.  
 rare

6 66 *Pteris* *dispan* Kunze? *P. semipinnata*  
 common locally in  
 disturbed part of forest

4 67 ~~Asplenium~~  
 common locally, terrestrial

5 68 *Tectaria* *variolosa* (Wall.) Copel.  
 very common, terrestrial

~~same - small wooded valley~~  
 5 69 *Croton* *unninghamii* M. & A.  
 very local

350 m.

leaves

tree 7 m. tall, leaves  
 somewhat glaucous beneath.  
 shrub 2.5 m. tall, sterile.

*Procris* *lamarkiana* (Hayata) Nakai

tree 8 m. tall; fruit immature  
 var. *castaneis* (Hayata) Masam. & Siegenke

200-300 m.

(Matsum.) Nakai

63 shrub, fruit pink.

64 shrub

65 small tree; leaves  
 glaucous beneath

var. *dispan* (Kunze) Baker

*Athyrium* *lanceum* (Thunb.) <sup>Milde</sup> Wagner, ined.

69 shrub 1.5 m. tall



same - small wet  
wooded valley

37370

*Cyathea*

abundant, forming  
a large part of understory

~~37370A~~

*Cyrtosperma pedunculata* (Hook.) Copel.

same - Tangled disturbed  
forest on lower slopes  
in valley mouth

37371

*Capricornium annuum* L.

rare

2

72

*Elaeagnus*  
common

1

73

*Polygonum chinense* L.  
common

6

74

*Turnipis turnata* Nakai  
common

2

75

~~*Psychotria*~~ *Ophionkiza linkiensis*  
common *Ophionkiza*

5

76

*Costus*?  
very local

same - wet valley bottom

+

77

~~*Pleurostachys*~~ *Pleurostachys*  
occasional *bambusoides* Sieb. var. aff.

150 m.

trunk 1.5 m. tall,  
leaves ascending.  
(2 leaves represented,  
one with tip from another  
from same plant).

80-100 m.

71

tangled herb, fruits  
red, not very hot.

72

scandent shrub,  
sterile; fruit, said to be  
eaten "subing"

73

scandent; succulent  
young stems slightly  
acid, peeled and eaten  
"sume"

74

tree 6 m. tall, fruit  
immature.

Hayata

75

erect, 0.5 m. tall; flowers  
white.

76

herb 1 m. tall, leaves  
conspicuously spiralled,  
flowers white.

80 m.

det FA

Mellere

(possibly)

(juvenile)

77

rhizomes deeply buried,  
horizontal, branches  
arising from the bottom  
of rhizome at intervals  
of 0.5 m. or more.



1956 Ryukyu Is.

June 8 - Reef on east coast north of Todoraki # 4 area perhaps 1000 m. wide

~~self~~ reef margin not at all raised, gently sloping off to a margin cut by surge channels, a few of which penetrate 50 m. or so, through the zone where a number of species of flat, short-branched corals are common. Seems to be basically a growth surface with a smooth Porolithon in area of numerous surge channels but not ~~a~~ very actively growing.

The zone of few surge channels shows abrasion and some flat corals, also abundant Turpinaria on back part, making an almost continuous dark drab green band about 20 m wide.

Then typical rather minutely rough reef flat for 300 m. or so, with thin algal felt.

The growth surface on the outer 50 m. is evidently a veneer on an old cut surface ~~about~~<sup>2-3</sup> dm. below the reef flat level. A few remnants of the old level remain, badly eaten and undercut.

No obvious agent ~~of~~ of abrasion but much abrasion evident on all bumps and points on algal surface and on reef flat remnants. A few loose rocks in deep tide pools, none lying on surface.

The 300 m. of reef flat is very slightly rolling in topography and slopes very slightly toward back and front from a central high area. The total relief is probably not 2-3 dm. covered by a rather good cover of Diadema.

inner has  
hills  
rounded  
corals  
stony  
sparsely  
over it.

The 400 m. next inward is lower and has a very irregular surface with a relief of perhaps ~~1~~<sup>some</sup> 1 m. patches being deep and sand bottomed, others shallow and rough and covered



by a large brown alga. This area has water flowing strongly northward at low tide, as there is no escape seaward through the reef ridge.

In shallower sand bottom pools is a sod of *Thalassia*, *Halophila* and *Cymodocea*.

The 300 m. between here and beach is shallower, not so rough but not smooth, with many large boulders covered by an algal felt with sand.

Bordered just below beach by a typical erosion ramp.

see p. 44

37378

*Turbinaria*

dominant on a strip just back of reef margin

~ 79

*Lagassum*

dominant on shallower ~~flat~~ areas in central part of reef.

~ 80

abundant on inner part of outer reef flat.

0 m.

mustard brown, soft.



- 37381 *Halimeda stipitata*  
common on outer part  
of reef at low tide level.
- 2 82 *Liagora*  
dominant on outer reef flat
- 83 *Halophila ovalis* (R.Br.) Hook. f.  
abundant locally  
in sandy areas at  
about mean low tide  
level on outer edge of  
inner reef flat.
- 3 84 ~~*Cymodocea*~~ *Halodule* ~~*uninervis*~~ *uninervis* (Forst.)  
abundant locally in  
sandy areas at about  
mean low tide level  
on outer edge of inner  
reef flat.
- 4 85 *Thalassia hemprichii* (Ehrenb.)  
abundant in sandy  
furnaces at and somewhat  
below mean low tide  
level on middle part  
and inner part of reef.

June 8 - mouth of Mizara Gawa  
mangrove swamp

- 5 86 *Bruguiera conjugata* (L.) Merr.  
common
- 3 87 *Kandelia candel* (L.) Merr.  
rare
- 6 88 *Rhizophora mucronata*  
abundant

erect from stalk  
buried in sand.

rhizomes buried in sand  
leaves partly protruding

*aschers.* det. C. den Hartog 1969

rhizomes buried in sand.

*Aschers.* in  
Petermann  
det. C. den Hartog 1969

rhizomes deeply buried  
in sand.

0 m.

small tree, 3 m. tall,  
calyx red, radicle  
pendent, hexagonal  
in cross section.

shrub 2 m. tall, buds  
whitish.

small trees, 3-4 m. tall,  
with stilt roots



June 9 - above Kaimas  
on Miyama

(71)  
(Photo  
950-10)

airfoliate  
tree  
Diospyros

Lowland thickets of  
Ficus, Macaranga,  
Premna, Boehmeria,  
Mallotus, Diospyros,  
Barringtonia  
tangled with Caesalpinia,  
Canavalia, Flacellaria,  
Gmelina, Lantana,  
Pongamia(?), Cibotium, Glochidion,  
undergrowth of Alocasia,  
Alpinia speciosa, ~~and~~  
Psychotria, Evodia, Maesa

Paspalum conjugatum  
abundant along trails.

A large Ficus, 15-18 m. tall,  
covered by epiphytes and  
aroids suggests what  
the forest may have been

(72)

Farther along the  
secondary thicket becomes  
more scrubby and  
has more native forest  
species in its composition  
at about 100 m. Quercus  
~~laevis~~ and Fraxinus appear,  
also Centideuma, etc.

(73)

Old fields at about 100-120 m.  
being invaded by Melia,  
Xanthoxylum, Macaranga,  
Mallotus, etc.

A small colony of *Ipomoea pes-caprae*

(74)

Lower slopes covered  
by a dense low wood  
of many species,  
mostly those associated  
with Quercus, but  
a few secondary ones.  
Trees mostly 5-8 m  
tall, less than 10 cm. dbh.  
Many are clusters  
of stump sprouts.

75

Along the stream valley  
the trees are taller about  
10 m., considerable diversity  
of species, but few trees  
over 10-12 cm. dbh.  
Shrub layer rather  
marked, but possible  
to walk without much  
cutting. Rather few lianes



(76)  
(photo  
949-  
950-11)

300 m?  
350

Up the valley the forest becomes taller, more and more big trees, much wetter, more ferns and much *Fragaria*.

Epiphytes more common here. Small species of tree fern common.

Much lumbering ~~is~~ is being done in this area.

(77)

Upward the forest becomes wetter, more luxuriant, but of lower stature.

epiphytes very common.

This would almost be regarded as rain forest. On ridge stature is still lower.

(78)

On a broad horizontal ridge just below summit is ~~thick~~ forest 10 m. or so tall.

Here are mud flats, locally, with no groundcover and little or no shrub layer.

Where there is no mud, shrub layer and ferns very well developed.

soil on summit Ametsan

pH 6 surface soil - brown

pH 4.5-5 3-10" down strong brown

pH 4-4.5 10"-30" " " "

Summit covered by extensive brake of *Pleiothlastus* - about 2 m tall on exposed summit, taller lower down. To 4 m.

A few shrubs scattered in the bamboo - *Cinnamomum*, *Viburnum*

Ground cover very well developed in bamboo of *Oplismenus*, ferns, etc. *Ligularia*

Going down s.w. ridge the same sequence is repeated in reverse. The forest is quite wet for a good distance down. Then a ridge that is drier, the forest largely *Quercus* but small size, ferns few in number, undergrowth not luxuriant.

Then in valley bottoms above Shira Mäzu there is tangled lowland forest.



June 9 - Shing Mizer, tribute, any  
~~tan~~ upper part of north  
 branch of Nagara-Gawa.

37389

Mallotus

*japonicus* M. & A.

30 m.

small tree or large shrub.

6

in thicket in ~~steep~~  
 deep river ravine

4

90

*Eugenia jambos* L.

of 3-4

50 m.

spreading tree,  
 fruit pinkish yellow  
 when mature, edible,  
 with strong flavor.

June 9 - bottom of stream  
 valley

June 9 - southwest  
 slopes of Omoto-san,  
 above Shing-Mizer

6

91

pass

*Tapinanthus pinnatus* (Cav.) C. Chr.

250 m

on earth banks along  
 trail in woods

2

92

*Asarum*

450 m

sterile; rhizome with  
 strong odor, between  
 licorice and Vick's  
 Vapo-rub.

common in wet woods

6

93

*Camellia latifolia* T. & G.

475 m

small tree 3 m. tall.

common in wet woods

3

94

*Damnacanthus*

500 m.

shrub 5-1 m. tall,  
 leaves glossy; fruit  
 immature.

occasional in wet woods

June 9 - plateau just  
 south of summit of  
 Omoto-san, Lake  
 in wet low forest

6

95

*Ligustrum**kulainensis* Kr. & G.

500 m.

small tree 4 m. tall;  
 flowers white, fragrant.  
~~several~~ stems from base.

rare.

5

96

*Scleria**peruviana* (L.) Fernald

common



- 37397 *Psychotria*  
common in undergrowth
- 5 98 *Polypodium*  
occasional, climbing  
tree trunks
- 5 99 (~~Skimmia~~) *Skimmia japonica* Thunb. (?) = *S. Butcheri* (Lam.) Nakai  
occasional
- 37400 *Eurya*? *Eurya sakishimensis* Hance  
rare (~~casual~~ *Butcheri* Itô)
- 3 01 (fungus)  
rare
- 4 02 *Mussaenda*  
occasional

June 9 - summit area  
of Omoto - ~~see~~ Lake  
in ~~the~~ dense brake of dwarf  
bamboo (*Pleioblastus*)

- 3 03 *Asplenium* *Athyrium fraxinifolium* (Muhl.) Muhl.  
very common under  
bamboo (also seen in  
forest below)
- 2 04 *Pleioblastus* *Shima* (F. & S. V.) Muhl.  
dominant on summit

- 5 05 { *Ilex fobergiana* Ha  
*Ilex* *muchagana* Muhl.  
occasional in <sup>summit of Omoto</sup> ~~cane~~ <sup>brake</sup> ~~June~~  
dense x
- 2 06 *Schefflera odorata*?  
in "fox-hole" on summit ~~Omoto~~  
*Stemodia himphylla* (Thunb.) Decaisne

shrub 2 m. tall,  
flowers pale green.  
*Microsorium hancockii* (Baker) Ching?

- small tree, bark and leaves  
highly aromatic; fruit immature
- 400 small tree, sterile,  
(attacked by fungus #37401)  
covering dead portions  
of *Eurya* sp. tree with  
a silvery white coating,  
giving an eerie impression  
in wet shady forest.
- scandent shrub,  
calyx lobe white, corolla  
yellow.

520 m.

*Diplazium donianum* (Mett.) Tard. - Bl.  
det. C. V. Morton

- 1st H. above 04 densely crowded,  
forming a brake 2-4 m. tall,  
canes orange color when  
mature.

Lake  
9, 1956

- 06 stem scandent shrub or vine,  
leaves conspicuously pinnatifid  
reticulate beneath, aromatic.



June 9 - south ridges of  
Omoto-san Dake  
in thick low wet forest  
(~~low~~) *Actinodaphne longifolia* (Bl.) Nakai  
occasional

37407  
3

3 08 *Hydrangea scandens* var. *chinensis*  
occasional (Maxim.) Muhl.

5 09 *Lindera* ~~*macrantha*~~ *macrantha* (H. & A.) Copl.  
occasional, climbing  
on tree-trunks.

3 10 (~~low?~~) *Styrax japonica* S. & Z.  
occasional

June 9 - gulches at  
northeast base of Omoto-san Dake

11 *Maesa* ~~*tenax*~~ *tenax* Mez  
common in second growth

June 9 - valley of Miyara-  
gawa, 1 mile north of  
Kainan Village

10 12 *Fraxinus griffithii* C. B. Clarke  
in second growth thickets

2 13 *Vincetoxicum*  
climbing in second-  
growth thickets *cynanchum chinensis* Winkl.

5 14 *Ficus ampelosa* Burmf.  
in second-growth thicket

15 *Bridelia wata* Decaisne  
in second-growth thicket

475 m small tree 6 m. tall,  
in bud only; leaves  
glaucous beneath.  
475 m. small tree 5 m. tall,  
flowers green, sterile  
flowers greenish white

475 m.

475 m.

200 m.

shrub 1 m. tall, showing  
a common abnormality.

100 m

tree 8 m. tall

vine twining in trees,  
petals bronze with  
greenish centers,  
corolla white.

small tree

small tree, leaves  
glaucous beneath,  
fruit immature.



June 10 -

(79)

(Photo  
945-24)

small mangrove swamp

low scrubby growth  
with considerable  
open ~~so~~ sandy, gravelly  
mud.

*Excoecaria* and  
*Rhizophora mucronata*  
most abundant, with  
considerable *Bruguiera*  
*conjugata*, some *Pumnitzera*  
*racemosa*, and with  
*Acroderdendrum inerme*  
getting down into swamp.  
also *Vitex* (prostrate form).  
Some open areas covered  
by *Paspalum vaginatum*,  
others, less low and  
wet, by *Panicum ambiguum*.

General height of  
~~the rest of~~ woody  
plants here is 2-3  
m., with some *Excoecaria*  
reaching 4 m.

(80)

(Photo  
945-24)

second small  
swamp toward  
Nagara, at mouth  
of small stream,  
has principally  
*Bruguiera*, with  
some *Rhizophora*  
especially toward  
the sea.

Borings yield a dark  
gray shell and coral  
snail, rather clayey  
in places, elsewhere  
gravelly.

General height of  
woody plants here  
about 2 m.



June 10 - mouth of  
Nagura-gawa

(81)  
(photo  
945-24)

broad open flats  
with no vegetation  
except here and there  
areas of sea-grass.

Areas of low mangrove  
mostly *Rhizophora*,  
some *Burquina*, a very  
little *Avicennia* and  
*Sonneratia*, also areas of *Paspalum conjugatum*.

None of this more than  
2-3 m. tall.

Exposed chert or  
schist rocks bear  
*Limbristylis*, *Hedyotis*,  
etc.

(82)

Along river bank  
a mixed forest of  
*Hibiscus*, *Pongamia*,  
*Ficus*, *Pandanus*,  
*Peritius*, *Raphirolepis*,  
*Porteria*, *Excoecaria*,  
*Premna*, etc. festooned  
with *Caesalpinia*, *Derris*,  
*Dalbergia* vines.

This is dense, tangled  
and penetrated with  
difficulty. It merges  
into the mangrove  
swamp in places.

(83)

Back of this is an  
open, grassy area,  
varied with thickets.  
Here the grass is principally  
*Ischaemum muticum*,  
with some *Imperata*.



1956 Ryukyu Is.

June 10 - ~~3.4~~ km. n.w. of Nagura, along coast s. of

- 37416 *Paspalum vaginatum* Swartz  
dominant in many wet saline places, usually submerged by high tide.

Shira Hama, at  
June 10 - mouth of small stream ~~2.7~~ 2.7 km. n.w. of Nagura

in mangrove swamp on muddy shell and coral marl.

- 17 *Bruguiera conjugata* (L.) Merr.  
commonest species

~~June 10 - mouth of Nagura~~

- 8 18 *Sunnitzera racemosa* (Saxf.) Vahl  
occasional

June 10 - mouth of Nagura + Galva

- 7 19 *Ischaemum muticum* L.  
abundant in low open ground back of river bank thickets.

- 2 20 *Fimbristylis cymosa* R.Br.  
on chert boulder in river-mouth mud flat

Kera laki  
~~Mafum~~

- 1 m. culms ascending; forming a loose sod.

0 m.

shrub 2 m. tall, with closely crowded prop roots and small "knees" or loops of root protruding above the mud; flowers with calyx red, petals dull orange.

1 Vahl

shrub 1.5 m. tall; leaves fleshy-coriaceous; flowers white.

1-2 m.

rhizome prostrate, on surface of ground, fruiting culms erect.

caespitose



1956 Ryukyu Is.

- 37421 *Caesalpinia* <sup>*naga* (Willd.) Ait</sup>  
 4 common in riverbank ~~forest~~  
 thickets  
 3 22 *Zostera japonica* Aschers. & Gr. det. C. den Hartog 1969  
~~*Cyrtosperma latifolium* Nakai & Satake~~ 0 m.  
 forming a thin sod on sandy  
 mud-flat exposed at very low tides  
 5 23 *Pouteria* <sup>*obovata* (R.Br.) Radlk.</sup>  
 occasional in river-bank  
 thicket.  
 5 24 *Catharanthus roseus* (L.) G. Don  
 large colony in open area  
 back of riverbank thicket  
 5 25 *Avicennia officinalis* <sup>*A. marina* (Frank.) Vahl</sup>  
 local in edge of  
 mangrove swamp  
 3 26 *Raphirolepis* <sup>*liukienensis* (Koidz.) Nakai</sup>  
 occasional in  
 river-bank thicket.  
 3 27 *Ficus* <sup>*superba* var. *japonica* Miq</sup>  
 common in riverbank  
 thicket

woody climber.

1969  
0 m.

1 m. shrub 2.5 m. tall.

2 m. flowers magenta.

0 m. shrub to 2 m. tall,  
 flowers orange, on  
 spreading lower branches.  
 1 m. ~~shrub~~ shrub 2.5 m.  
 tall.small tree, almost  
 deciduous, at this  
 season, fruits pink to  
 purplish.



June 11 - Miyara River  
3 km. n.w. of Miyara

(84)  
(photo 940-26)

trifoliate  
secondary  
tree.)

Thickets and woods  
along river on banks  
and limestone bluffs.

Hibiscus tiliaceus and  
several species of Ficus,  
Melia, Pterocarpus, Cordia,  
a tall bamboo Ochrosia,  
Melanolepis, and a number  
of other trees, tangled  
and festooned with  
Caesalpinia 2 spp., Clematis,  
Ipomoea, Ampelopsis,  
Canavalia, Clerodendrum  
inermis, Wedelia biflora  
and other vines and scrambling  
shrubs. Flagellaria, Smilax, Dioscorea,  
Dioscorea.

The ground, in many  
open places, is grass  
covered, especially Oplismenus,  
in more shaded  
places, fern covered, by  
Thelypteris.

June 11 - 3 km. n.n.w. of  
Miyara

(85)

Outcrop of volcanic rock  
covered by grove of small  
pines, periphery by  
Imperata. Under pines  
growth is sparse, with  
Pilea, Aneilema, Vernonia,  
Elephantopus, Polygonum,  
Commelina, Oplismenus,  
Desmodium, Osbeckia,  
Clematis, Viola, Oxalis,  
several other weeds, most  
of them quite underdeveloped.  
Ground mostly covered by  
pine needles.

June 11 - 0.7 km. e. of  
4 km. n. of Miyara

(86)

Outcrop of thinly bedded  
schist. Covered by sparse,  
recently burned Imperata,  
with considerable  
Andropogon, various  
other grassland species,  
as Wahlenbergia, etc.  
in small amounts.



June 11 - 1.5 km.  
north of Miyara

87

dissected limestone roughly aligned in parallel short ridges and rows of rough outcrops, some with furrows or very shallow ravines between them, more commonly with elongate cultivated patches between them. Where there are cultivated patches the ridges are accentuated by throwing of coral picked up in the patches on the ridges.

Where not cultivated the spaces between the ridges are covered by *Imperata* with many associated species. *Rosa* and *Psidium* are very conspicuous.

*Setaria*, *Thespesia*, *Paspalum*, *obiculare*, *Fimbristylis*, *Lycopodium*, *Pabiates*, *Lespedeza cuneata*, *Centella*, *Elephantopus* are all common.

Ridges vary from almost bare to bushy. Usually some *Miscanthus*, *Ficus*, *Ampelopsis*, *Polypodium*, *On larger ones Pandanus*, *Toddalia*, *Morus*, *Pipturus*, *Arenga*, *Allophylus*, *Smilax*, *Lycopodium*, *Thelypteris*, *Broussonetia*, *Crataeva*, etc.

88

Patch of woods of *Ficus* 2-3 spp., *Hibiscus*, *tiliaceus*, *Morus*, *Rhus*, *Pipturus*, *Melia*, etc. *Melaleuca*, *Pterocarpus*, forming a fair canopy, tangled with *Ipomoea*, *Smilax*, etc. *Lycopodium*, *Flagellaria*, *Clematis*, thick undergrowth of *Andisia*, *Psychotria*, *Damnanacanthus*, *Alocasia*, *Boehmeria*, *Euridia*.

89

across road is outcropping of Eocene limestone.



June 11 - 1.5 km. n. of Miyara,  
s. of Miyara, Makinaka  
in grass on shallow soil  
between limestone outcrops.

- 37428 (~~det~~) *Tenisonia viscidulum* var. *miquelii* (L.)  
occasional  
3 29 *Fimbristylis monostachya* (L.) —  
occasional  
3 30 *Fimbristylis dichotoma* (L.) Vahl  
occasional  
5 31 ~~*Thespesia japonica*~~  
locally common *Apulda montana* L.

- 2 32 same - cultivated field  
*Duchesnea indica* (Andr.) Focke  
weed in cultivated  
field, in full sun.

- 3 33 same - on rough limestone outcrops  
*Polypodium scolopendria* (L.) Presl  
common *Microsorium scolopendria* (L.) Presl

- 2 34 *Thelypteris*  
common *Cyrtosperma acuminatum* (Hassk.) Nakai

- 2 35 *Randia sinensis* (Lour.) R. & S.  
occasional

- 2 36 *Broussonetia papyrifera* (L.) L'Her.  
occasional

- 2 37 *Crataeva neliifera* G. Forst.  
rare

- 4 38 *Allophylus* *kennerlyi* (Dr.) M.  
rare

- 3 39 *Polygonum chinensis* L.  
common

6.5 - 30 m.  
↓

- (Hank.) flowers <sup>with lobes</sup> deep pink, tube white.

Hank.

- 30 culms single or in  
tufts of 2 or 3.

- 31 culms single, ~~erect~~ erect  
from prostrate base  
on stilt roots.

- 32 prostrate; petals yellow.

- 33 fronds erect.

- 34 shrub, fruit immature  
branches rigidly decussate.  
35 shrub; sterile.

- 36 shrubby; sterile.

- 37 shrub, flowers white

- 38 extensive scrambling  
herb. flowers white.  
creeping prostrate stems  
rooting at tips.



1956 Ryukyu Is.

37440 *Phascelus*  
occasionalsame - in patch of  
dense tangled woods1 41 *Morus* (autumnal var.)  
common2 42 *Muraya paniculata* (L.) Jack.  
occasional, edge of wood5 43 *Randia sinensis* (Lam.) R. & S.  
very common in undergrowth2 44 *Psychotria*  
common in undergrowth

25

Akashita,  
June 11 - bridge over  
Miyara River, 3 km.  
n.w. of Miyara  
in old quarry in  
argillaceous limestone5 45 *Nephrolepis exaltata* (L.) Schott  
abundant5 46 *Pteris vittata* L.  
common5 47 (grass) *Pogonathrum crinitum* (Thunb.) Kunth  
common1 48 *Euphorbia* *chamaesyce paraguayensis*  
occasional5 49 *Wedelia biflora*  
common4 50 *Melanolepis multiglandulosa*  
commonin thicket on side of  
road cutflowers yellow,  
keel twisted.

80 m.

tree 6 m. tall, spreading.

442 shrub 1.5 m. tall;  
flowers white.

43 shrub 2.5 m. tall.

44 shrub.

70 m.

45 fronds erect.

46 fronds ascending

47 A.  
chess48 erect, tip arching,  
flowers white.(Blanc.) Hara  
49 sprawling herb,  
flowers yellow.



- same - in river terrace forest, limestone soil
- 37451 ~~bamboo~~ *Bambusa multiplex* (Lour.) Rostk  
2 common
- 5 52 *Ageratum houstonianum* Mill.  
occasional in small opening.
- 5 53 *Orchid* *Hemilia nagaensis* Gand.  
small colony in grass under trees
- 5 54 *Erodia* *meliope auradana* (Hutchins.) Ohwi + Hutchins.  
common in understory
- 5 55 *Erodia* *galeata*  
common in understory
- 5 56 *Oplismenus compositus* (L.) Hb. K. det A. Chase  
carpeting ground under trees
- 5 57 *Cordia dichotoma* Forst.  
common
- 5 58 (~~anth?~~) *Antidesma pentandrum* Vahl.  
occasional *boerhaavia* Merr.
- 1 59 *Mucuna urens* (L.) DC.  
rare

June 11 - 0.7 km. e. of Kawahara,  
4 km. n. of Miyako  
grassy schist outcrop

- 1 60 *Lagenophora repens* (L.) Kuhn

15 m.

del.  
F. A.  
Hutchins.

- culms scattered, green, erect, 8 m. tall.
- 52 ~~flower~~ sprawling branched herb, flowers mauve blue.
- 53 erect from ~~depressed~~ globose ~~growing~~ corm, sepals and 2 petals green, lip white with purple lateral veins.
- 54 shrub 2 m. tall, ♂
- 55 shrub 2 m. tall ♀
- 56 stems prostrate fruiting culms ascending
- 57 tree 5 m. tall, almost leafless at this season; fruits green.
- 58 woody vine, catkins greenish.
- 59 pods hanging on dead vine.

40 m.



1956 Ryukyu Is.

June 11 - 3.5 km. n.n.w. of  
Miyara, 0.5 km. n.e. of Akashita  
in small grove of pines  
on volcanic outcrop  
*Lilium longifolium*  
common

37461  
5

June 12 - 2 km. s.e. of  
Dacho-yaki to 2.2 km. e. of  
Dacho-yaki

Smooth grassy hills,  
rather closely grazed.  
Grass mainly *Imperata*,  
with much *Pteridium*  
of small size, fronds  
not more than 3(-4) dm.  
long. Many herbs  
such as *Evolvulus*,  
*Blumea*, *Gynura*, 1 *Ipogonum*,  
peculiar lythraceous one,  
*Thelypteris*, etc.

Scattered fairly large  
spreading pines.  
These mostly show  
fire scars and charring  
on lower part of bark.  
Undoubtedly the area has  
been burned not long ago.  
Patches of *Alpinia speciosa*  
on upper slopes.

As H. Foster this was  
burned about 10 months ago.

Scattered small  
depressed shrubs at

(90)  
Unlabeled (56)

(91)

bulb scales bright yellow,  
white within.

*Psidium* and *Rosa*

(91)

In shade of pines are  
more species of herbs  
as *Ligularia*, *Yucca*,  
*Desmodium*.

92

Steep east-facing cliff  
has some scrappy pine.  
*Miscanthus*, *Asplenium*,  
*Eurya* spp., *Ardisia*,  
shrubby *Quercus cuspidata*,  
and, notably, *Leucophaea*  
of sericea + a few other  
shrubs, on steeper parts,  
on gentler slopes *Imperata*  
and *Pteridium*.

(93)

Upper open pine woods  
with *Leucophaea* and scattered  
shrubs grades into a

(94)

mixture of pine and  
dense scrub forest of



Wentlandia, Eurya, Cyathea, Ficus, and many other broad-leaf evergreen shrubs and small trees. Loose shrub layer inside with ferns and Ligustrum. Dense scrub edges with glaucous Pandanus, Miscanthus, Pteridium, etc.

95

In head of large wooded ravine - a considerable colony of Livistona - many trees, from small rosettes to trees with trunks 5 m. tall. Leaf tips droop but not as much as in some cultivated specimens. All petioles seen are spiny, the spines long, sharp, and well separated. Older trees have last year's inflorescences. No new ones seen.

96

On some exposed <sup>steep</sup> south slopes the vegetation is a mixed scrub.

97

High pine woods tend to have undergrowth largely Miscanthus in places.

98  
(photo 945-34)

Asbeckia

Wind beaten Eurya and Rhododendron shrubs common in edges of pey pine, some Miscanthus, Imperata, Lycopodium, etc. on high moor. One laevigata bush.

Back a little but Rhododendron, Cycas, Glochidion, etc. Ligustrum, etc. form a dense scrub. A few pine in edges.

99

Some volcanic breccia here.

From here up to crest is thick forest, 10-12 m. high of Diospyros, Antisia, Lauraceae etc. Trees as much as 25 dm. dbh. (or even 4 dm). Floral layer of Psychotria, Croton, etc. badly disturbed by cattle. Ferns abundant on ground. Some lianes.

100

Forest on crest much the same, but slightly lower stature. Ferns become an important component. Livistona and Arenga fairly common, one Livistona seen 10 m. tall.

101

at the summit the forest is somewhat denser.



open beneath less  
ferns and other  
ground cover, though  
this may be due to  
grazing as on one  
bed of ferns there is  
more luxuriant  
ground cover.

A few epiphytic ferns,  
incl. *Asplenium nidus*,  
*Pyrosoma*, *Nephrolepis*.

(101)

The crest is a broad  
rounded ridge,  
rising to a gentle  
peak then descending  
to a saddle.

(102)

In the saddle the  
forest is somewhat taller,  
to 15 m. and has some  
enormous ferns.

A few secondary trees  
seen here, cf. *Masarang*,  
*Ferns*, *Livingstonia* rather  
common. Some seen  
with petioles spicely  
only half or  $\frac{1}{3}$  to top.  
Only 15-20 cm. of  
segment tips dropping.  
*Garcinia* *apricata*  
occasional.

A climbing *Piper* and  
an aroid, cf. *Raphidophora*,  
very common here.

An enormous centipede

seen 1.5 m. up on a bush.  
Another seen the other  
day also on bush.  
"maga" (sp?) said to  
be a bush.

(103)

Back from saddle southward  
on west slope is a considerable  
grove of *Livingstonia*, up to  
15 m. tall. All have  
petioles turning in lower  
half or  $\frac{1}{3}$ . Most have  
some half grown fruit.  
Ground tends to be  
bap beneath them,  
but with a few ferns  
and with *Ligularia*.  
Very few dead leaves  
persist on palms.

Trunk base, outer  
layers tend to be eaten  
off by insects, so bap  
seams become obscure.  
Longitudinal fissures  
prominent. Color a dull  
reddish brown.

Slope forest on contour  
with bottom of saddle  
mixed, palms prominent.  
*Ardisia*, *Dioscorea*, *Ficus*  
etc. Ferns along  
luxuriant especially  
in gulch bottom. Forest  
10-15 m. high. Some epiphyte.

(104)



(105)

Ravines in dissected coastal terrace are filled with thickets. Trees seen include *Pinus*, *Rhus*, *Glochidion* - *Miconia*, *Artocarpus*, *Ficus*, *Pandanus*, *Elaeagnus*, *Mallotus*, *Ehretia*.

June 12 - 2 km. s.e. of <sup>Kura</sup>~~Dadifu Saki~~ on north peninsula.

on grassy slopes and low hills with scattered pines

37462 *Melastoma* <sup>Oshichi</sup>  
5 common locally on low ground in deep grass.

2 63 (~~base~~) <sup>M. *achillean* *chunlongii* S. & Z.</sup>  
common in low wooded ravines

4 64 *Ehretia* <sup>*dicksonii*</sup> ~~*var japonica*~~ Nak.  
common in low wooded ravines

ridge s. of Kura Dake

~~same~~ - upper edges of forest along crests of ridges

2 65 *Itea* <sup>*formosana* H. & L.</sup>

2 66 *Hibiscus* <sup>*mutabilis* L.</sup>  
rare

5 67 *Eurya*  
common

6 68 *Pinus luchuensis* Mayr.  
abundant, dominant locally, scatters elsewhere

35 m.

*dicksonii* L.

flowers rose pink.

small tree; leaves somewhat glaucous beneath, old inflorescence red.

64

small tree, fruit greenish yellow.

150 m

shrub 2 m. tall  
shrub 2 m. tall

shrub 1.5 m. tall,  
fruit immature  
spreading tree 10 m. tall, 3 dm. dbh.



- 37469 *Viburnum awabuki* K. Koch  
common  
6  
6 70 *Scavola* ~~sp~~ *sericea* var.  
rare on brink of cliff  
in open grassy nose  
3 71 *Ficus foveolata* var. *thunbergii*  
local, clinging to rocks  
in edge of pine ~~forest~~

Kura Dake,

June 12 - 2-2.2 km. e. of  
Dachogaki Dadifu Saki  
in dense moist forest  
9 72 *Asplenium* <sup>*Colysis* *wrightii* (Hook.) Ching</sup>  
abundant in bottom  
of moist ravine cut in  
Schist

- 5 73 *Alpinia*  
common <sup>*Alpinia* *striata* (Thunb.)</sup>

- 4 74 *Heteromilax* *japonica* Kunth.  
*Smilax* det. T. Koyama 1959  
occasional

- 2 75 orchid *Calanthe* *fournesii* Schl.  
occasional, terrestrial

- (*Stauntonia hexaphylla* (Thunb.) Decaisne)  
2 76 *Schefflera odorata*  
rare

- 150m 15 small tree 6 m. tall;  
fruit red, not quite mature.  
10 50 shrub 1.5 m. tall  
flower white with  
purple veins.  
(Maxim.) King 11 1 vine, clinging to  
rock but with  
erect branches, also  
with characteristic  
witches brooms; sterile.

200-250m

- V 1 dark green, fertile  
fronds erect, sterile  
spreading.

- V 2 rhizome aromatic,  
stems ascending.  
fruit immature, smooth.  
11 4 extensive climbing  
stem from a hard  
tuberous rhizome;  
fruit immature

- V 5 ~~flowers~~ leaves a dull  
translucent grayish  
green; flowers white  
with ~~a~~ a bright  
orange spot in middle  
of leaf.

- 11 6 sterile woody vine,  
leaves with conspicuous  
reticulate venation beneath.



June 13 - s.w. base of Banna-dake  
on weedy roadside

37477 *Crotalaria* *mucronata* Desv.  
occasional

5 78 *Paspalum conjugatum* Berg.  
abundant

3 79 *Ipomoea pes-caprae* var. *brasiliana*  
several plants seen

1 80 *Artemisia* *capillaris* Thunb.  
common

1 81 *Wedelia* *chiriana* (Aubl.) Merr.  
common

5 82 *Vincetoxicum* *linkianum* Winkl.  
occasional in thicket

3 83 *Melochia corchorifolia*?  
common

1 84 *Hedyotis*  
rare

5 85 *Distylium* *saccharinum* (L.) Merr.  
common in thickets

5 86 *Ageratum conyzoides* L.  
common

1 87 *Lyssemaclia mauritiana* Lam.  
occasional

erect much-branched herb  
1 m. tall, flowers bright  
yellow with dark brown  
spot at base of wing.

erect culms from  
creeping superficial  
rhizomes.

prostrate, flowers  
bright purple collapsing  
about 4 p.m.

erect herb, odor not  
very strong.

prostrate, flowering  
stems ascending,  
flowers yellow (rare at  
this season)

milky herbaceous  
vine, flowers with  
corolla lobes reddish  
with green centers.

corolla white; pods green.  
flowers pale lavender.

flowers white.

shrub 2 m. tall,  
flowers white.

erect strong smelling  
herb; flowers white.  
leaves fleshy, flowers  
white.



s.w. base of Banna-lake  
small shrine with  
no forest around it.

(106)

(photo  
940-8)

The gently sloping  
land at the foot of the  
mountain is covered  
by an irregular mixture  
of thickets and grassy  
or weedy patches. The  
thickets are mainly  
*Acacia confusa*, probably  
planted, and pine, perhaps  
planted. The younger  
thickets have consider-  
able ground cover of ferns,  
etc. Older ones have very  
little. Mixed with the  
planted trees are native  
ones, such as *Ficus*,  
*Distylium*, etc. Some  
*Miscanthus* here and  
there in edges and thin

spots. The small  
road is lined with  
weeds, dominantly  
*Paspalum conjugatum*  
and *Imperata*, but  
many other species.

(107)

The slopes above, examined  
with binoculars, are  
semi-open, with  
bushes and grass,  
mostly *Miscanthus*  
in most places.

*Acacia confusa* goes  
well up the slopes.



June 15 - <sup>shore</sup> southeast of  
Hirai

Photo  
847-8

- (108) Beach ridge with scrub  
of *Scaevola*, *Premna*,  
*Pandanus*, *Miscanthus*,  
*Hibiscus*, *Vitex*, *Messerschmidia*,  
*Wikstroemia*, *Clerodendrum inerme*,  
mostly closed, varying from  
1.5 to 2 (or even 3) m. in height.

a little  
guettarda  
ferminiana  
or Wedelia  
biflora

- (110) From the front of the ridge  
a rough but abraded limestone  
platform protrudes about  
20-25 m., about 3 m. above  
a well developed erosion ramp,  
this notably abraded and  
with an accumulation of  
well rounded cobbles and  
pebbles at top and scattered  
in pits and pot holes on it.  
Platform in places undercut  
as much as 2 m. the top very  
well abraded, elsewhere not  
undercut, fringed by a pebble  
or cobble beach. Ramp about 1 m. high.  
In undercut places fresh  
water dripping from ceiling  
(heavy rain yesterday and  
last night).

Locally some patches of  
sandy beach. Here are  
scattered *Ipomoea pes-caprae*,  
*Euphorbia charnissensis*.

*Lepturus repens*, etc.

On the top of the platform  
the relief is about 1 m.,  
generally. The vegetation  
is a mixture of *Ipomoea*,  
*Pemphis* (very prostrate),  
*Carmona* (very prostrate),  
*Hedyotis*, *Lepturus*, *Indigofera*,  
*Limonium* (?), and patches  
of low bushes of *Hibiscus*,  
*Messerschmidia*, *Scaevola*,  
*Cinnamomum*, *Vitex*, *Euphorbia*, *Artemisia*, etc.  
The cover is rather full  
but in places there is  
considerable limestone  
showing.

*Thunbergia*  
*Ardisia*  
*Premna*  
*Cassytha*  
*Lilium*  
*Wedelia*  
*Fimbristylis*

- (111) Large stretch of beach  
on photo has been somewhat  
eroded, exposing patches  
of the platform and  
large areas of pebbles  
and cobbles. This  
has scattered tufts of  
*Euphorbia*, *Lepturus*, *Messer-*  
*schmidia* (very small  
bushes, *Scaevola* seedling,  
etc. Some *Thunbergia*.  
The sand is being  
excavated and hauled off.



(109)

plain back of beach ridge where coral is very close to surface and is exposed here and there. Some small areas of this are cultivated. Mostly it is in grass, chiefly *Imperata*.

Close to the beach ridge there are scattered bushes of *Decasol*, *Premna*, *Vitex*, etc. especially on limestone outcrops.

Away from the ridge there are more and more replaced by *Psidium*, *Rosa*, *Osteomeles* (?), *Raphirolepis*, *Ampelopsis*, *Rubus*, *Callicarpa*, etc.

Many herbs, especially *Evolvulus*, *Lespedeza*, *Desmodium*, *Leucas*, etc. in grass.

Farther away from beach *Psidium* becomes very abundant in grass. In places it may form half the cover.

Patches of *Agave americana* are occasional. Cycads are not common here but are found.

June 15 Ohama - mouth of inlet

(112)  
(Photo  
847-46)

scrubby forest on rough limestone. Mixture of *Pithecellobium*, *Ficus*, *Artocarpus*, *Broussonetia*, *Pandanus*, *Pouteria*, *Murraya*, *Mallotus*, *Carmona*, away from sea, *Macaranga*, *Ficus* sp., *Melanolepis*, *Erythrina*.

Enormous orb-weaving spider with leg spread of 18 cm. or more. Several colors, very small males or else another species, not more than 1.5 cm. across commensal in same web. Large overeating scarab.

Interrupted inland by small patches of garden between outcrops. Trees get taller inland. Varies from about 2 m. on outer edge to even 8 m. inland. Some *Calophyllum*, *Casuarina* and *Acacia* inland, perhaps planted.

This whole forest very dense and tangled with vines - *Ampelopsis*, *Caesalpinia*, *Clematis*, *Polygonum*, *Toddalia*, *Vitis*,



(113)

On west side of inlet is well developed beach rock with seeps of fresh water trickling down over it and seeping out of it. Maximum thickness seen about 0.3 m.

Mostly rather fine grained ~~Maximum thickness~~

Upper parts rather pitted lower parts in places broken up. Some loose beach sand locally.

A *Phyllanthus*-like shrub but leaves not distichous, common at base of cliffs and on upper part of beach, with *Hibiscus*, *Clodendrum*, various grasses, etc.

On limestone bluffs is scrub of *Hibiscus*, *Pandanus*, *Arenca*, *Erythrina*, *Pipturus*, *Ficus*, etc. *Pittosporum*, *Ligustrum*, *Carronia*, *Raphirolepis*, *Premna*, *Garcinia*.

Dense tangled, 2-4 m. high.

*Pandanus* and *Hibiscus* are most abundant.

On eroded beach rock well below high tide level, *Limonium* (?) *Zoysia*, etc. grow abundantly in pits and crevices. Above this, especially on sandy spots, *Sporobolus pes-caprae* and *Zoysia tenuifolia*, *Euphorbia*, *Chamissoa*, etc. are abundant.

114

East of Ohama along shore is rather extensive beach scrub of *Scaevola*, *Hibiscus*, *Pandanus*, *Premna*, etc. *Clodendrum*, etc. The shore here is low and shelving, composed of a mixture of sand and coral gravel, occasional outcrops of post-miocene limestone some of them huge boulders or remnants. The sandy and gravelly flats here where not covered by beach scrub, are grassy, with *Sporobolus virginicus* below high tide level, several other halophytes, *Zoysia tenuifolia* and *Sporobolus pes-caprae* in patches above



high tide.

In large limestone boulders ~~is~~ is a sparse scrub of *Premna*, *Pittosporum*, *Carmona*, *Ficus*, *Pomplia*, *Messerschmidia*, *Raphiolepis*, ~~with~~ *Lepturus*, *Zoysia tenuifolia*, *Hedyotis*, etc.

June 15 - Between Miyara and Shirasu

(114) Wide coral plain between road and coast, very little of it in cultivation, mostly in pasture.

The half nearest the road is a mixture of *Imperata* with *Miscanthus* probably *M. sinensis*, judging by the very narrow leaves. The soil is thin and scab-like outcroppings of the rough limestone are frequent. Many herbs and considerable *Psidium* mixed with the grass. Large areas have broken coral rock in pebble sizes instead of soil. A few small clumps of *Cycas*.

115

116

Toward the sea the *Miscanthus* drops out and *Imperata* and *Pectaria* are the abundant grasses. *Psidium* is frequent. *Rosa*, also. Many herbs and a few shrubs are mixed in.

Principal herbs seen are:

*Lespedeza cuneata*  
*Artemisia*  
*Galium*  
*Euphorbia hirta*  
*Leucas*  
*Panicum reptans*  
*Conyza bonariensis*  
*Emilia sonchifolia*  
*Fimbristylis monostachya*  
*Centella asiatica*  
*Vernonia cinerea*  
*Desmodium* spp.  
*Phaseolus*

June 15 - just east of Shirasu-saki

119

The shore here is peculiar. There is an erosion ramp about 50 m. wide, pitted and covered by solution basins. <sup>Little P. no abscission evident.</sup> *Imperata* is abundant here, below high tide level. A little



*Sesuvium* with it.

118

Heavily  
grazed

Behind this is a flat about 30 m. wide, of a veneer of sand covered by a dense stand of *Zoysia tenuifolia* with a few miscellaneous herbs. Many young *Messerschmidia* along landward margin.

117

Then a broad boulder-cobble ridge, covered by a low beach scrub of *Messerschmidia*, *Pandanus*, *Clerodendrum*, *Scaevola*, with *Thuarea*, *Vitex*, *Zoysia*, etc. in openings.

In grassy flat back of boulder ridge <sup>300</sup> ~~100~~ m or more from sea are many large pieces of pumice lying on the ground, on rough coral.

Here the rough limestone outcrops are arranged somewhat in rows, rather zigzag, perpendicular to the coast.

June 15 just west of Shurab

120

band of low tangled bushy vegetation on limestone. A mixture of *Pandanus*, *Cycas*, *Alpinia speciosa*, *Miscanthus*, *Toddalia*, *Carmona*, *Calophyllum*, *Albophyllum*, *Premna*, *Psidium*, *Munroa*, *Mallotus*, *Ficus*, etc.

This is tangled with *Ampelopsis*, *Wedelia*, and *Clematis*.

This is mostly 2-3 m. tall, but where there is much *Calophyllum* it may be 5-6 m.

Here and there patches are cleared in this and planted to 2 varieties of *Sorghum* and *Puffa* (?).



June 15 - ~~Miyazaki~~ 1 km. e.  
of Miyazaki Miyazaki

in grassland on soil  
between outcrops of  
rough limestone.

37488

~~Portulaca~~

3

occasional

2

89 Vernonia cinerea L.  
common

2

90 Conyza bonariensis  
common

1

91 (rub) Eragrostis corymbosa L.  
rare

1

92 Wahlenbergia gracilis (Forst.) A. DC.  
occasional

June 15 - 1 km. ~~West~~ of Ohama,  
on Miyazaki-Wan, near Isobe

3

93 Lotus australis Andr.  
occasional on sandy beach

3

94 Lophora tomentosa L.  
rare on limestone boulders

3

95 Pemphis acidula Forst. f.  
occasional on rough limestone

5

96 Ficus vetusa var. villosa (Thunb.)  
occasional on rough  
limestone boulders

7

97 Sesuvium portulacastrum  
salt flat, inundated  
by high tide

37488a Scaevola taccada  
(Gaertn.) Rostk.

erect, flowers yellow.

flowers purplish.

small plants flowering,  
larger ones not yet.

flowers bluish violet.

1 m.

prostrate, flowers white.

small shrub

depressed shrub,  
flowers white.

depressed shrub,  
figs purplish.

(L.) L.

prostrate, very fleshy,  
stems greenish with  
reddish nodes, leaves  
green, glossy, compressed,  
flowers pink.



37498 *Suaeda* *australis* (R.Br.) Moq  
5 local on saline flat,  
inundated by high tide

2 99 *Galium*  
on rough limestone in  
edges of bush.

37500 *Sporobolus virginicus* (L.) Kunth  
2 dominant on sand flats  
below ~~high~~ tide level.

June 15 - just east of  
Ocharma, on Miyara Wan

2 01 *Limonium* *albescens* (Maxim.) Makino  
abundant on rough  
limestone below high tide level.

5 02 *Ligustrum* *japonicum* Thunb.  
common on low limestone  
bluffs above beach

5 03 *Phyllanthus*? *flupeoides* M. & A.  
*Securidaca*  
common at top of beach

6 04 *Solanum* *verrucosifolium* L.  
rare in scrub on rough  
limestone

6 05 *Polystichum* *cyrtomium* (L.f.) Presl  
on shaded limestone cliff

June 15 - Tada Hama,  
on coast s.e. of Hirai

on sandy beach ridge

2 06 *Digitaria*  
occasional

5 07 *Scaevola sericea* Vahl  
very common in beach scrub

erect, very fleshy.

1 dwarf shrub, mostly  
sterile, a few in bud.

2 shrub 1-1.5 m. tall,  
fruits very immature.

3 shrub 1 m. tall

4 shrub 2 m. tall; flowers  
white, ripe fruit yellow.

1-3 m.

6 culms spreading

7 shrub 1.5 m. tall;  
flowers white, fruit white.



- 37508 *Allophylus* <sup>*turnerianus* (DC.) Bl.</sup>  
occasional in beach ridge scrub.
- 2 09 *Scaevola sericea* var.  
common in beach ridge scrub.
- 6 10 *Ipomoea* <sup>*littoralis* Bl.</sup>  
common at edges of beach ridge scrub.
- 5 11 *Chenopodium* <sup>*acuminatum* Willd.</sup>  
common on sandy patches on limestone terrace just above sea.
- 2 12 *Indigofera* <sup>*lutea* (L.) Malme</sup>  
common on rough limestone just above sea.
- 2 13 *Cassytha filiformis*  
occasional, parasitic on various plants on rough limestone near sea.
- 1 14 *Lepturus repens* (Forst.) R. Br.  
very common on rough limestone near sea.
- 2 15 *Artemisia* <sup>*capillaris* Thunb.</sup>  
common on rough limestone near sea.
- 5 16 *Leucas*  
common on rough limestone near sea.
- 2 17 *Lotus* <sup>*australis* A. DC.</sup>  
occasional on rough limestone.
- June 15 - Yuriga Harra,  
1 km. e. s. e. of Miyara  
on coast.
- 1 18 *Pilea* <sup>*peplodes* H. & A.</sup>  
on rough limestone at top of beach, in

- shrub 1 m. tall.
- shrub 1 m. tall, flowers  
— purplish, fruit white.  
prostrate, flowers  
— rose purple, darker  
in throat.  
erect
- prostrate, flowers red;  
pods quadrangular.
- Twining yellow stems.
- flowers white.
- prostrate, flowers  
white
- 1 m.
- stem fleshy.  
pits and crevices,



June 16 - north of Ozata  
east of Kara-lake

(121)  
(Photo  
950-4)

Scattered pines on  
grassland on schist  
gullies either grassy or  
filled with Pandanus scrub.  
Some admixture of miscellaneous  
shrubs and small trees.

- 122 Eocene limestone area  
~~covered by~~; where it is  
not much dissected -  
covered by a thick forest  
of Ficus, Diospyros,  
Ardisia, etc. scarcely  
any undergrowth except  
tangled bases of lianes.  
Scattered second story  
trees.

Canopy irregular  
6-10 m. Mainly Ficus  
and Diospyros, but  
occasional Melanolepis  
and Macaranga, Garcinia.  
Ardisia, Viburnum and  
small Diospyros in  
second story.

Lianas are Smilax,  
Piper, Clematis, Eleagnus, Cypripedium,  
spiny Randia, Pisonia aculeata

Almost nothing  
on ground except a  
few creeping Piper vines.  
Much bare angular  
rock exposed, mostly  
limestone but some of  
it rather sandy.  
Some Alocasia, and  
very few ferns.

Locally <sup>in central part of forest</sup> several other  
trees. Pisonia aculeata  
very commonly climbing  
through trees. ~~Fruit~~ <sup>Fruit</sup> abundant on  
ground and hanging  
in trees. Arenga common  
generally.

123

In ~~scattered~~ <sup>central</sup> part are  
enormous jointed  
castle-like blocks of  
limestone, simulating  
human construction.  
Banyan roots enveloping  
many of these.

124

The higher parts  
of the forest are  
perhaps 15-20 m. and  
are principally enormous  
banyans. Under them  
are Diospyros, Garcinia,  
Murraya <sup>sparingly</sup> ~~blended~~ with  
Smilax, Flagellaria, etc.



Working gradually seaward and downway over a series of escarpments, encountered more and more post-Miocene limestone, but never completely ~~lost~~ left the Eocene limestone. Finally, at the same time, there were quantities of large pumice cobbles and Hibiscus and Hernandia became common, then dominant. To them Diospyros and Ficus, with some Ardisia and Garcinia had made up the greater part of the forest.

(125) The marginal 100 m. or so are a solid, somewhat windheaved, stand of Hibiscus and Hernandia with some Pandanus.

At the top of the beach is a belt of Viter, Ipomoea pes-caprae, Clerodendrum and small bushes.

The inner edge of the reef flat is littered with a great abundance of large boulders, up to 2 m. or more in diameter. Most of these are post-Miocene limestone, a few

are Eocene.

126

At the mouth of the southernmost dry inlet are some fine Eocene boulders out in open similar to those in forest. Also a contact, vertical(?) between Eocene and post-Miocene. The contact is in the bottom of the inlet with Eocene much higher on south side of inlet.

Trees & shrubs at top of beach - Calophyllum, Clerodendrum, Wikstroemia, Terminalia catappa, Thespesia, Messerschmidia, Dodonaea, Lophora, Colubrina, Guettarda. All except the first 3 and Messerschmidia are rather scarce.

Scaevola seen only on the north end, within a ~~few~~ couple of hundred meters of the stream mouth.

127

1-2 m.  
tall

Along the stream is a clearing that is filled with <sup>old</sup> field scrub, + pass. Viter, Dodonaea, Scaevola, Pandanus, Freziera?

128

A small patch of Bruguiera in stream above bridge. Below bridge stream is lined



with *Excoecaria*. Back  
of this is a scrubby  
mixture of *Erythrina*,  
*Ficus*, *Cerbera*,  
*Leucaena*, *Ehretia*,  
*Dodonaea*, and *Pandanus*.  
*Clerodendrum* *incense*,  
*Cassia*, *Psidium*,  
*Alpinia* *speciosa*,  
*Calophyllum* *lanceatum*,  
*Fraxinus*?, *Heinandia*, etc.  
3-5 m. tall.

n.e. of Ozato,  
June 16 - coast east of  
~~Kana-dake~~ south of mouth  
of Toro gawa.

on sand flat at top of beach

- 37519 ~~(37519)~~ *Pongardia indica* var. *argenteifolia* (Wight) Wedd. 2 m.  
rare  
3 20 *Quettarda speciosa* L.  
rare in edge of forest.  
5 21 *Wedelia prostrata* (H. & A.) Hemsl.  
local in grassy area  
6 22 *Allophylus timorensis* (DC.) Bl.  
rare in edge of forest  
3 23 *Colubrina asiatica* (L.) Brongn.  
rare at edge of forest  
3 24 *Dodonaea viscosa* (L.) Jacq.  
rare at edge of forest  
1 25 *Ipomoea stolonifera* (L.) J. E. Gueld.  
rare and local

June 16 - s.w. base of  
Banna-dake  
Rice field weeds - *Ageratum*  
*conyzoides*, *Eclipta alba*,  
*Hypericum* sp., *Marsilea* sp.,  
*Lindernia* sp.,  
*Arthraxon hispidum*,  
*Centella asiatica*,  
*Gnaphalium sonchifolia*,  
*Panicum repens*,  
*Echinochloa crus-galli*,  
*Monochoria vaginalis*,  
*Polygonum* sp.

fruits red, plumed.

shrub 2 m. tall.

very prostrate,

flowers yellow.

shrub 1.5 m. tall, buds

white; fruit, not quite mature.

shrub 1 m. tall, sterile.

shrub 1.5 m. tall, sterile.

prostrate, flower white.



114

1956 Ryukyu Is.

- 37526 *Ilex japonica* (Burm.) Nakai  
common on bare sand
- 1 27 *Ilex repens* (L.) A. DC.  
common on bare sand
- 2 28 *Chenopodium acuminatum* Willd.  
occasional on bare sand
- 2 29 *Lepturus repens* var.  
occasional
- 30 ~~(illud.)~~ *Cassia* *Indigofera picta* var.  
occasional at edge of forest
- 31 ~~(illud.)~~ *Philosorus wrightii* Hook. f.  
common
- 32 *Limonium carolinianum* (Makino) Makino  
common

June 14 - terraces <sup>n.e. of</sup> of  
~~Karadake~~ Ozato  
in dense forest on  
dissected Eocene limestone

- 2 33 *Damnacanthus*  
rare
- 6 34 *Premna* *obtusifolia* A. DC.  
common locally
- 1 35 ~~And~~ *Mucuna*  
common locally

Ishigaki I.

115

- rhizome buried, running,  
flowers yellow.
- rhizome buried, running,  
leaf blades flat on  
surface of sand; flowers yellow.  
erect
- tufted
- shrub 1.5 m. tall
- 1 m.
- forming dense mats  
and cushions; fruits  
red.
- dwarf shrub, buds only.

10-20 m.

- ~~tree~~ very small shrub,  
sterile.
- tree 8 m. tall, flowers  
pale green, ripe fruit black.  
~~(seeds picked up)~~  
vine climbing in tops of  
trees (seeds picked up  
on ground beneath).



116

1956 Ryukyu Is.

37536 (euph.) *Mallotus philippinus* (Lamour.) Miq. - A.  
10 rare5 37 *Pisonia aculeata* L.  
common3 38 *Boehmeria formosana* Hayata  
rare3 39 *Lysimachia obovatifolia* Miq.  
local3 40 *Randia canthioides* Champ. ex B.  
common5 41 *Viburnum australis* Lindl.  
rare5 42 *Ficus konishii* Hayata  
commonFeb 17 - north of mouth of  
Todoroki-gawa5 43 *Zanthoxylum armatum* Maxim.  
common on sand ridge  
back of beach

Ishigaki I.

117

small tree 6 m. tall;  
fruit red.37 scrambling vine  
climbing in tree tops,  
thorny and ~~has~~ spiny  
and spineless, not  
certain if different  
plants or branches of same,  
& spiny branches may  
be from different plants,  
fruits picked up on ground.  
38 herb 1 m. tall.

39 flowers yellow

40 scrambling ~~as~~ shrub  
with tendency to  
produce rigid short  
branches; fruit immature.41 small tree, 4 m. tall,  
fruits immature.42 tree with large  
buttresses at base of  
trunk, fruits on small  
branchlets coming out of  
trunk and large limbs.

4 m.

43 rounded densely branched  
bush; leaves glossy,  
fruits green, glandular.



June 17 - Ishigaki City -

Cultivated plants observed:

Trees: *Garcinia spicata**Calophyllum inophyllum**Morus* sp.*Prunus persica**Carica papaya*2. *Cocos nucifera*2. *Areca cathecu**Ficus retusa**Casuarina equisetifolia**Podocarpus macrophyllus**Ehretia**Citrus**Melia**Livistona**Hernandia**Delonix regia*

*Erythrina*  
*Hibiscus*  
*tiliaceus*  
*H. schroyer*

shrubs: *Codiaeum variegatum**Cycas revoluta**Hibiscus* (anamental hybrid)*Rosa**Cordyline**Polyscias quinifolia**Bougainvillea**Acalypha*garden plants: *Luffa* sp.?*Xanthosoma sagittata**Musa**Cremora**Luffa**Cucurbita*

Shrine forest:

*Calophyllum inophyllum* - large, 300 yrs.*Casuarina equisetifolia**Ficus retusa**Ficus**Hernandia*



June 13 - Taketomi, shore  
near pier -

narrow sandy beach  
backed by a low sea wall.  
Back of the wall is a  
narrow strip of  
scrub.

Between the pier and  
Hagayama is agricultural  
land. It is merely  
the accumulated soil  
between closely spaced  
outcroppings of rough  
limestone. On there, and  
even on piles and fences of  
rock picked up from the fields,  
Cycas is very abundant.

In the small fields or  
plots, sugar cane, sesame,  
~~many beans~~ sweet potatoes  
and millet were observed.

*Acacia confusa* (~~not~~ *szechuanensis*)  
planted for typhoon protection  
and for wood.

Hagayama Village:

*Rosa* sp., *Chrysanthemum* sp.,  
*Asclepias curassavica*,  
*Catharanthus roseus*, *Canna*  
hybrid, *Codiaeum variegatum*,  
*Zephryanthus rosea*,  
*Sarcocolla*, *Podocarpus*, *Morus*,  
*Garcinia*, *Gladiolus* sp. planted in one yard

Hagayama Village -

The streets are lined  
with *Garcinia*, *Morus*,  
*Podocarpus*, *Erythrina*, *Livistona*,  
*Carex*.

*Morus* used in sericulture.  
*Garcinia* used for house construction.

Island is 2.5 ~~mi~~ <sup>around.</sup> *ri* (1 *ri* = 4000m).  
223 families on island, 1100 pop.  
88 cattle and some goats.

Nishito shrine -

*Ficus vatica*

*Pouteria*

*Melanolepis*

*Ficus gibbosa*

*Garcinia*

monument to grave of  
Nishito, historical figure  
who worked on Okinawa  
in construction of Shuri Castle.  
grave is here. Old shrine  
was replaced in 1953.  
Some stones said to have  
been brought from Okinawa.

Hagayama.

Tower on paleo-geologic outcrop  
about 10-12 m. above surrounding  
country. General aspect  
of country from here is  
wooded, but this due  
to wind breaks or hedges  
mainly of *Acacia confusa*.



## Sei mei Otake

Calophyllum (Yanabu)  
 Garcinia  
 Melanolepis  
~~Ficus retusa~~  
 Pongamia or Viterocarpus  
 Ponteria  
 Trema  
 Laurac.?  
 Ficus (large lf. depressed fr.)

## Kuninaka Otake

Garcinia (fukugi)  
 (enamous)  
 Ponteria  
 Ficus retusa  
 Laurac.? (tabu) (bark used  
 for incense)  
 Arenga  
 Diospyros  
 Pisonia aculeata (vine)  
 Muraya

## Kohamato Otake

Laurac. (tabu)  
 Garcinia Ponteria  
 Diospyros  
 Melanolepis  
 Ficus gibbosa  
 Ficus retusa  
 Livistona  
 Alocasia very abundant  
 large rock outcrop

Portulaca pilosa  
 (giroba gusa) brought  
 in by a person named  
 Giroba. Has become a pest.

Artemisia (native) juice  
 used for stomach aches.  
 (nūpan (Y))

Phaseolus  
 "Oyobu zu" used for  
 (green) (bean)

bean sprouts. Taken on  
 long voyages for Trochus  
 where fish vegetables  
 otherwise unobtainable.

Elaeagnus  
 "kinashii" (T) "inuchii" (I, O)  
 wood for construction

A few Areca, but not used.

Codiaeum, Acalypha amentacea  
 Ipomoea erecta, Alternanthera  
 versicolor, Cannas, Tagetes,  
 Rosa, Ficus retusa, Acacia  
 confusa, Erythrina, as  
 ornamentals around school.

Piper sp. growing over  
 walls. Young leaves used  
 cooked with rice. Ripe fruit  
 dried and used as pepper.



neither wet or dry rice cultivation on Taketomi. Soil is shallow. Water is short.

Even drinking water is a problem. When rains are plentiful some well water is used. Some rain is stored in cisterns. Otherwise water must be brought from Ishigaki.

Ramie is commonly cultivated, also mung beans, sweet potatoes, sugar cane. Black sugar like panela is produced. Bananas are common, especially around villages. When they are not destroyed by typhoons enough are produced to ship to Ishigaki.

Mr. Yonaguni, village chief, supplied most of the above information that could not be gained by superficial direct observation. He says there are some habu here.

Weeds in fields and along paths:

*Euphorbia heterophylla*  
*Bidens pilosa*  
*Lespedeza orientalis*  
*Lettaria* sp.

*Artemisia vulgaris*  
*Solanum aculeatissimum*  
*Sparganium angustifolium*

*Coryza canadensis*  
*Euphorbia hirta*  
*Coryza canadensis*

*Kalanchoe pinnata*  
*Boehmeria nivea*  
*Lonchocarpus*

*Digitaria*

*Verbena*

*Emilia sonchifolia*

*Cardiospermum*

*Cyperus rotundus*

*Echinochloa colinum*

*Euphorbia hirta*

*Eleusine indica*

*Lynedrella nodiflora*

*Gynura*

*Imperata cylindrica*

*Artemisia*

*Coryza*

*Lettaria*



~~(128)~~ on rock piles and outcrops between the fields. Cycas is generally common, but more so at lower elevations. Higher, Musa sp., Miscanthus sp., etc. are also very common.

Shrine toward east end.

(129)  
(photo 865-25)  
(nos 129-133)  
Garcinia  
Ficus retusa  
Laurac.  
Diospyros  
Canica  
Terminalia catappa  
Podocarpus  
Arenca (forming thick undergrowth)  
Melanolepis  
Ehretia  
Psychotria  
Porteria Rhabdophora

Another farther east:

(130)  
Diospyros, Garcinia  
Melanolepis, Melia,  
Murraya, Ficus  
retusa, Broussonetia  
Laurac. Canica  
Rhabdophora, Psychotria  
undergrowth of Arenca  
Porteria, Elaeodendron,  
Diospyros fovea? Hibiscus  
tiliaceus

(131) Toward east on limestone outcrops are thickets of Murraya, acacia, Toddalia, Rhusa, Cycas, Miscanthus etc.

(132) A few small plots of acacia confusa, in addition to much of it along trails and on outcrops and stone fences with Cycas, etc.

(133) East of this more open country, still coral outcrops, but fewer hedges and thickets. Some scattered Calophyllum and Erythrina trees.



1956 Ryukyu Is.

Plants seen in thickets  
and hedgerows.*Cycas revoluta**Acacia confusa**Psidium guajava**Miscanthus floridulus**Ampelopsis**Arundo donax*?*Clematis**Vitis*

Taketomi I.

(134)

(Photo  
865-25  
and  
150-27)

Beach scrub forest  
on east coast  
slopes toward beach  
from height of  
back from beach is  
mainly *Hernandia* and  
*Pandanus*, with  
*Calophyllum*, *Pouteria*  
Approaching beach  
*Scaevola* becomes dominant,  
with *Messerschmidia*  
*Quettarda*, *Sophora*, *Agave*,  
*Pneroma*, *Wikstroemia*, *Pittosporum*

Along beach *Zoysia*,  
*Vigna*, *Euphorbia*,  
*Wedelia*, *Cassytha*,  
*Ischaemum*, *Spermo-*  
*per-caprae*, *Thuarea*  
*Cinnam*, *Chenopodium*,  
*Vitex*, *Spinifex*, *Ilex*,  
*Sporobolus*, *Lescurium*, etc.  
form a belt back of the active beach, widest  
at the point.  
South of the east point

(135)

~~At the south end~~ is a  
shrine forest that is  
merely a very luxuriant  
place in the beach forest  
with giant *Calophyllum*,  
*Erythrina*, *Ficus retusa*,  
*Pouteria* and *Quettarda*  
trees. These trees are  
generally with very low  
trunks and widely spreading



limbs. The canopy is complete, at about 10 m. There is little undergrowth but a good ground cover of *Nephrolepis*, *Flagellaria* some seedlings of the trees, esp. *Calophyllum*.

There is no actual edifice here, only an open sandy space, oval in outline, about 6 m. across, 10 m. long, with a round stone receptacle with sand for burning incense and a rotted stump with small vases.

It is a quiet and very impressive spot. Some *Aedes* mosquitoes, though, as in all other shrine forests.

Near south end there is a low escarpment of rough limestone rising to 2-4 m.

(136)

At its base in the forest is a layer of pumice up to 3 dm. thick.

The limestone is covered generally by ~~beach~~ scrub of

*Scaevola*, *Dandanus*, *Guettarda*, *Messerschmidia*, *Remyn*, *Ficus* etc. *Ledum* on edges in pits.

Exposed parts have conspicuous mps from about high tide level to 3 m. ~~Exposed~~ A strongly developed erosion ramp about 15 m. wide at base, with solution basins and patches of *Limonium*.

Here the ~~beach~~ forest or scrub is quite narrow. Where the exposed limestone ledge disappears, to the east, the forest gets wider. A dune ridge has accumulated on the outer side of it, just back from the beach. This may be 1-1.5 m. high or even a little more, sloping gradually away from the highest part back of the top of the beach.

Just back of the forest is a large area of *Miscanthus* and small thickets. The stand is irregular but generally



thick, difficult to  
traverse, hiding  
rough limestone boulders  
and outcrops.

June 18 - e.s.e. of Hazama  
broken cultivated land  
with rough limestone  
outcrops, rock piles, and  
stone walls. *B. linearis* DC.

37544 *Berchemia rhamnoides*

2 rare on rocky places

2 45 *Conyza canadensis*

common in cultivated land

2 46 *Erigeron villosus* (Thunb.) Kunze

occasional in fallow  
grassy field

1 47 *Acalypha australis* L.

occasional in fallow grassy field

5 48 *Clematis*

common in thickets  
and on rock fences

2 49 *Imperata cylindrica* var. *major* (Humb.)

dominant in fallow grassy field

2 50 *Zephyranthes* ~~sp.~~

rare in fallow grassy field

*Conyza heterophylla* (L.) Link.

3 51 *Euphorbia heterophylla* L.

common on roadsides  
and in fallow fields

5 52 *Abutilon indicum* (L.) Sweet

occasional along trails

20 m.

prostrate.

det. A. Chase

spreading and ascending.

extensive  
climbing vine, flowers  
cream white, very fragrant.

det. A. Chase  
E.C. Hurlb.

rhizomes deeply buried

flowers bright pink;  
locally believed that the  
blooming of this flower  
indicates that it will rain.  
herb up to 0.8 m. tall, lower  
parts of bracts scarlet

det. A. Chase

shrub up to 1 m. tall,  
flowers orange.



1956

Ryukyu Is.

*Euphorbia hirsuta* var. *capitata* (Forsk.) Spring  
*Crotophaga halimii* (Forsk.) Spring

37553

*Gynura*

common weed in fields

2

54

*Ligustrum orientale* L.

common weed in fields

2

55

*Lynedella nodiflora* (L.) Gaertn.

common weed in fields

3

56

*Munaya paniculata* (L.)

common in thickets

2

57

*Ampelopsis* *sinensis* var.

common in thickets

1

58

*Musa*

abundant in thickets

2

59

*Verbena officinalis* L.

common along paths

2

60

*Digitaria sanguinalis* (L.) Dulac

common in fields

2

61

*Abutilon* *retrofractum* (L.) Sweet

occasional along paths

2

62

*Leucas*

common in fields and rocky places.

2

63

*Cardiospermum* *halimifolium* var.

common along trails and edges of fields

2

64

*Emilia sonchifolia* (L.) DC.

common in fields

2

65

*Bidens pilosa* var.

common in fields

1

66

*Lonchocarpus* *diversus* L.

occasional along trails

Benth.) S. Moore Taketomi I.

det. R. O. Bolcher

22

erect, aromatic; disk  
 red, tubes of flowers yellow  
 flowers yellow.

22

flowers yellow

Taka.

shrub 1.5 m. tall.

leaves bright green

vine, with greenish  
 flowers and blue berries.

small plant, 2 m. tall,

"trunk" dull ~~brown~~ gray-  
 brown.

bracts glaucous,

bronz purple,

flowers dull yellow.

flowers bright lavender

det. H.  
 Chap.

culms spreading

flowers white

microcarpum (H. B. K.) HBK.

climbing, flowers white.

flowers purple

not much exceeding involucre.

disk yellow, rays  
 short, white



June 18 - east of Hazama  
in edges of shrine forest

- 37567 *Ehretia dicksoni* var. *japonica* -  
common

- 6 68 *Psychotria* *luteivensis* Hatanaka?  
common in undergrowth

- 4 69 *Croton* *cunninghamii* M.-A.  
common in undergrowth

- 2 70 *Carmona* *retusa* *Elaeagnus* *microphylla* Lam.  
occasional in undergrowth

- 3 71 ~~*Eleocharis*~~  
occasional *Eurychorda* *japonica* Thunb.

- 72 *Diospyros* *persea* ? var. *bracteata*  
occasional

June 18 - Hazama  
in village

- 2 73 *Phaseolus* *mungo*  
cultivated in small fields  
on coral limestone soil

- 2 74 *Artemisia* *subulana* Thunb.  
common along paths

- 2 75 *Echinochloa* *colorum* (L.) Link.  
weed in bean field

20 m.

- Nakai 11 67 small tree, ripe fruit  
yellow. Wood used in  
construction  
"kinashi" (Taketomi) "inuchi"  
(Ishigaki, Okawa)

- 68 shrub 2.5 m. tall;  
flowers greenish white; fruit immature;  
stipules small, triangular.

- 69 shrub 1 m. tall

- 70 shrub 1 m. tall; fruit  
immature.

- 71 large shrub or small tree,  
flowers pale green.

- 72 small tree; fruit  
immature

20 m.

- 73 flowers greenish yellow,  
keel twisted.

"nyokuzui" (豆) (n. green bean)

said to be used for bean  
sprouts, also made into  
sweet soup.

erect herb, branched  
from base, somewhat  
aromatic.

Nakai 11 culms ascending



- 37576 *Solanum aculeatissimum* Jacq.  
2 edges of thickets

- 3 77 *Piper ~~bromae~~ <sup>hirsutum</sup>* Maxim.  
very common, climbing  
on stone walls

- 2 78 *Boerhavia mutabilis* R.Br.  
around stone steps  
in ~~the~~ public place

- 4 79 *Portulaca pilosa* L.  
common in paths and  
fields.

Aibaru Tabi,  
June 18 near east point  
of island  
littoral ~~forest~~ scrub forest

- 2 80 *Hibiscus tiliaceus* L.  
common in

- 2 81 ~~causab.~~ *Eugenia <sup>lanceolata</sup>* (L.) Maxim.  
common on inner edge of

- 3 82 *Toddalia asiatica* Lam.  
common generally in thickets  
and on inner edge of

- OK edges of thickets.  
herb 0.8 m. tall, ripe  
fruit scarlet.  
77 vine fruit immature,  
(red when ripe), "pishi" (T)  
young tips ~~of~~ of plant  
used to flavor rice,  
mature fruit dried and  
used for pepper.  
prostrate; flowers  
pinkish white;  
leaves purplish beneath.  
OK 78 prostrate, leaves  
fleshy; flowers magenta,  
about 6-8 mm. across.  
said to have been brought  
in as an ornamental  
but now has spread  
and is a pest. Brought  
by one Jimku, so is  
called "jimku-gusa".

2-3 m.

- OK small tree, flowers  
yellow with maroon  
center, turning reddish.  
vine climbing in bushes,  
flowers yellow, immature  
fruit with white stripes.  
herbage with maroon odor when bruised.  
OK scrambling shrub.



- 37543 *Vitis* <sup>*lamata* Roxb.</sup>  
<sup>2</sup> *in trichets*  
 occasional on inner edge of
- 2 84 *Wedelia* <sup>*lilifera* (L.) DC.</sup>  
 common on edges of
- 3 85 *Colubrina asiatica* (L.) Brongn.  
 occasional in edges of
- 2 86 *Allophylus* <sup>*limosus* (DC.) Bl.</sup>  
 occasional in edges of
- 2 87 *Hernandia sonora* L.  
 dominant in
- same  
 at top of sandy beach
- 2 88 *Ischaemum muticum*  
 common
- 2 89 *Angelica* <sup>*japonica* A. Gray</sup>  
 occasional
- 2 90 *Cimicifuga asiatica* <sup>*orientalis* (L.) Turcz.</sup>  
 occasional <sup>*japonica* Baker</sup>
- Chamaesyce atoto* (G. Don.) Craze
- 2 91 *Euphorbia charnissensis* Boiss.  
 common
- 2 92 *Sparganium* <sup>*littorale* (Burm. f.) Merr.</sup>  
 common
- 1 93 *Chenopodium* <sup>*acuminatum* Willd.</sup>  
 occasional
- 2 94 *Cirsium* <sup>*brevicaule* A. Gray</sup>  
 common
- 3 95 *Vigna muna* Burm.  
 common <sup>*Phaseolus*</sup>
- ✓ 96 *Portulacastrum* <sup>*lescurianum* (L.) L.</sup>  
 common
- 2 97 *Lotus* <sup>*australis* Andr.</sup>  
 common

- vine, flowers greenish.
- 84 scrambling aromatic  
 herb, flowers yellow.
- 86 low shrub, flowers white
- 87 small tree 4-5 m. tall,  
 flowers whitish.
- 1-2 m.
- prostrate, branches  
 ascending to erect.
- erect herb 1.5 m. tall,  
 now dry and leafless.
- rosettes of curved leaves,  
 erect scapes to 0.8 m. tall,  
 flowers white, stamens  
 and style purple.
- stems spreading to  
 ascending.
- forming loose mats
- erect.
- heads bright purple.
- prostrate, forming  
 huge mats; flowers yellow
- prostrate, fleshy,  
 flowers pink.
- prostrate, flowers white



142

1956 Ryukyu Is.

~~same~~ Busashi,  
June 13. - south coast  
of island  
on pitted eroded edges  
of limestone terrace

37597<sub>a</sub>

*Sedum* ~~*polysanum*~~ H. C. B.  
locally common.

Hayama Village

*Lagerania* cult.  
on walls.

3 m.

Tabetonia ?

143

fleshy, flowers yellow.

138

June 19 - Kuntomari-saki  
extensive sand flat  
covered by ~~low~~ scrub  
tangled mass of *Scaevola*,  
*Pandanus*, *Guetarda*,  
*Clerodendrum*, *Pouteria*,  
*Pittosporum*, *Allophylus*,  
*Flagellaria*, *Sophora*,

139

South of here is a dune  
ridge 1-2 m. high. In  
this is a low forest of  
*Hernandia*, *Ficus*, *Pouteria*,  
*Pandanus*, *Elaeodendron*,  
*Scaevola*, *Messerschmidia*,  
~~*Quercus*~~ *Guetarda*, *Hibiscus*,  
*Persea*, ~~*Calophyllum*~~, etc.  
Back of this is a strip  
of *Scaevola* thickets  
and cultivated patches.



This strip of forest is generally only 50-100 m. wide.

Near its north end is a trail leading in to a primitive shrine, only a circle of stones with a hollowed out cylindrical one with sand for burning incense. This forest around the shrine is principally *Hernandia*, some *Guettarda*, *Ficus* and *Porteria*. It is 10-12 m. high, with loose undergrowth of *Elaeodendron* & *Morinda*, etc.

Southward the dune ridge is replaced by a rough limestone terrace, covered by essentially the same forest.

At the first good exposure of this the sand beach sounds hollow when tramped upon.

up to  
5 dm.  
5 ft.

Along the whole southwest coast the forest comes down to the top of the beach, with little or no herbaceous growth. No sand flat with grass, etc. as on the other side. On the north side of Kuntomorisaki proper there is a rather broad strip of *Schinifer*, *Thuarea*, etc.

Then along the west coast there is solid beach rock, clear up to the low beach ridge which is covered by tall scrub. North the ridge is replaced by a ledge of limestone, still with a broad ramp of smooth beach rock.

The scrub along this coast is 2-4 m. high, about the same composition as that south of the point. A few *Casuarina*, and very rarely, *Thespesia*. A rather narrow strip, backed by *Leucaena* and *Acacia*.



East of village -  
cultivated patch -  
and considerable  
thickets of *Calophyllum*,  
127 *Cycas*, *Melanolepis*,  
*Podialia*, *Rochmorus*,  
*Acacia* confusa.  
Moss, *Melisa*, *Ficus wightiana*,  
*Pandanus* (abundant  
locally)

Just back of the littoral  
forest is a dense growth  
of *Louisaena*. Several  
small patches of  
densely planted *Calophyllum*  
also one of *P. docarpus*.

Thick undergrowth of  
*Cycas* in one *Calophyllum*  
patch. *Louisaena* in others  
has been cut out.

Littoral forest very dense  
*Calophyllum*, *Hervandia*,  
*Pandanus*, *Hibiscus*  
about 4-5 m high. Comes  
clear to sea wall.



June 19 - Taketomi island

The vegetation may be mapped, though not too satisfactorily, by setting up the following units (outlined on photo #150-27):

1. Village area - street lined with stone walls around the house-lots.

*Ehretia* <sup>and</sup>  *Garcinia*, and *Podocarpus* trees, tending to be taller, grow along the streets just inside the stone walls. Inside the walls, also, are garden plots and many ornamentals. Vacant lots have patches of sweet potatoes, mung beans, etc.

2. Open cultivated area - a patchwork of small cultivated plots, separated by stone walls, outcrops, hedges, etc. The stone walls and outcrops are covered by clumps of *Cycas revoluta* and thickets of *Acacia* and various shrubs. The principal

crops are sugar cane, mung beans, sweet potatoes, sesame, millet, <sup>bananas</sup>, ramie, in about order named.

3. Cultivated area with thickets: similar to unit #2 except that as much as 25% of the area may be covered by thickets and small plantings of *Acacia confusa*, *Sescaena glauca*, and various bushes, *Miscanthus*, etc. *Melanolepis* is common.

4. Sward grass - This seems to be abandoned cultivated land, where the rock outcrops are too numerous and soil is too shallow even for these people to farm successfully. The area is a mixture of dense *Miscanthus* up to 2-3 m. tall and woody thickets. Progress through this is very slow and uncomfortable. Hidden rock outcrops, boulders, and holes make walking even more painful.



## 5. Littoral forest and scrub.

This is a strip around the coast, on sand and rough limestone, of tangled growth of various strand species, in places forming a scrub 1-2 m. high, in other places a low forest, up to 10 m.

The composition varies. The scrubby aspects are usually dominated by *Scaevola sericea* with various accessory species.

The ~~scrub~~ forested part is most often dominated by *Hernandia*, but in some places by *Pouteria*, *Ficus*, or *Pandanus*.

The seaward side usually slopes smoothly toward the beach, suggesting that wind and spray are important elements in the local climate.

On the southeast side and locally elsewhere there is a herbaceous strip, usually on level sand, between the edge of the scrub and the top of the beach. Here may be found *Vitex*, *Sporobolus* *prostratus*.

*Spinifex*, *Thuarea*, *Ilex*, *Sporobolus*, *Zoysia*, etc.

## 6. Thinning forests:

There are small patches of usually dense woods containing some of the largest trees to be found on the island. The composition varies greatly. *Garcinia*, *Ficus*, "tabu", *Melaleuca*, *Diospyros*, *Calophyllum* and *Pouteria* are the trees most usually found.

## Weeds seen, not collected:

*Euphorbia prostrata*

*E. hirta*

*Portulaca oleracea*

*Kalanchoe pinnata*

*Melilotus*



152

1950 Ryukyu Is.

June 19 <sup>Omasu</sup> Northwest coast  
on sand above sea wall37598 *Ipomoea pes-caprae* var. *brasiliana*  
common5 99 *Ipomoea* <sup>*littoralis* Bl.</sup>  
<sup>*granilis* R. Br.</sup>  
common37600 *Zoysia tenuifolia* Willd.  
common3 01 *Thuarea involuta* (Forst.) R. & S.  
common2 02 June 19 - east of Hayama  
*Polypodium scolopendria*  
local on pile of limestone  
between fields.2 03 June 19 - coast west of  
Hayama  
*Pemphis acidula* Forst.  
rare on eroded limestone  
about high tide level  
2 04 *Clerodendrum inerme* (L.) Gaertn.  
common, edge of littoral scrub  
3 05 *Vitex* <sup>*trifolia* var. *simplifolia* Cham.</sup>  
common, at edge of  
littoral scrub~~06~~ ~~Rap~~June 19 - near Kuntomari-saku  
littoral scrub forest2 06 *Raphiolepis* <sup>*rubra* (Noddy) Nakai</sup>  
rare in edge of

Tabetomi!

153

2 m.

trailing; flowers purple,  
collapsing about mid-  
afternoon.trailing; flowers rose  
purple, much deeper  
in throat.

OK A. Chase

S. 10 11 Trailing, forming loose  
mats.

20 m.

Burn. f. *Microsorium scolopendria* (L.) Presl.

1 m.

OK prostrate shrub,  
flowers white.OK shrub 1 m. tall;  
flowers white.  
prostrate, flowers  
blue-violet.2-3  
m.(shrub 2 m. tall,  
fruit immature)



- 37607 *Scaevola sericea* Vahl  
common in edge of
- 2 08 *Messerschmidia argentea* (L.f.) Johnston  
common in edge of
- 2 09 *Pouteria alberta* (R.Br.) Boerl.  
common in
- 2 10 *Scaevola sericea* Vahl  
common in edge of
- 2 11 *Premna obtusifolia* R.Br.  
occasional in edge of
- 2 12 ~~*Wikstroemia elliptica*~~  
*Wikstroemia elliptica*  
rare in edge of *W. retusa* A. Gray
- 2 13 *Lepturus rebeus* var.  
occasional in  
sand at edge of
- 2 14 *Morinda citrifolia* L.  
in undergrowth in
- 3 15 *Pandanus tectorius* var.  
common in *lindleyana* Vahl.
- 3 16 *Smilax china* v. *kusa* Nakaguchi & Kanehira  
rare at inner edge of *det T. Koyama 1957*
- 5 17 *Oplismenus patens* Vahl  
common in inner edge of
- 3 18 *Ficus insignis*  
rare at inner edge of *F. supplea* var. *japonica* Mig.
- 2 19 *Boehmeria nipponensis* var. *cordata* (Maxim.)  
rare in undergrowth  
at inner edge of
- 2 20 *Guetlunda speciosa* L.  
important component of
- 2 21 *Lophora tomentosa* L.  
occasional at edge of

- 7-3 07 shrub 1 m. tall,  
flowers purple.
- Johnst. 08 shrub 1.5 m. tall,  
flowers white.
- 09 Tree 8 m. tall,  
fruit immature.
- 10 shrub 2 m. tall,  
flowers white.
- 11 shrub 1 m. tall,  
flowers pale green,  
fruit immature.
- 12 sterile shrub, 1 m. tall.
- 14 sterile shrub 1.5 m. tall
- 15 small tree 3 m. tall, stamens  
bracts cream white.
- 16 vine, tangled in shrubs;  
fruit immature.
- det A. Chow 17 culms almost erect,  
decumbent bases  
on stilt roots.
- ohwi 18 small tree 4 m. tall, figs pinkish.
- 19 weak shrub
- 20 tree 5 m. tall  
flowers white, fragrant
- 21 shrub 1.5 m. tall



1956 Ryukyu Is.

- 37622 *Pandanus tectius* var.  
5 common in *Liukiuensis* Wats. ?  
2 23 *Terminalia catappa* L.  
rare in  
2 24 *Pittosporum tobira* (Willd.) Ait.  
occasional in scrub  
margin

June 19 - coast west of  
Hazama, edge of scrub  
in edge of scrub on  
sand flat.

- 2 25 *Ipomoea indica* (Burm. f.)  
rare *I. congesta* R. Br.  
2 26 *Lysimachia mauritiana*  
occasional  
2 27 *Paspalum vaginatum* Swartz  
local along beach  
1 28 *Ixeris japonica* (Burm.) Nakai ?  
local along beach  
1 29 *Rhaphanus*  
occasional along beach  
~~30 *Asarum*~~

June 19 - Hazama  
around village

- 2 30 (acanth.) *Ipomoea pes-caprae* L. var. *procumbens*  
common in yard  
2 31 *Commelina auriculata* B.  
common on roadside  
2 32 *Polygonum chinense* L.  
common climbing over walls  
2 33 *Commelina ~~radifolia~~* *C. diffusa* Forst. f.  
common on roadside

- small tree 3 m. tall.  
fruit yellow when ripe.  
shrub or small tree,  
3 m. tall, bud only.  
shrub 1 m. tall, fruit  
immature

1-2 m.

- vine tangled in scrub;  
flowers blue, turning purple.  
flowers white

culms ascending.

rhizomes deeply buried.

flowers purple; plants  
mostly dry and fruiting.

20 m.

det. E.C.  
L. & M.

flowers pinkish.

det. F.R.F.

plant creeping,  
flowers blue, 2 petals  
large.

vine; flowers white.

det.  
F.R.F.

prostrate, flower blue, 3 petals  
large.



158

1956 Ryukyu Is

June 19 - <sup>Omasu</sup> ~~northwest~~  
northeast of Hazama

37634

*Cycas revoluta* L.

5

very common on  
walls and limestone  
outcrops.

Tabetomi I.

159

5 m.

D.K. trunk 1.9 m. high,  
cone erect. Leaves very  
immediately around base.



June 20 - end of Kabira peninsula  
back of Ishi-saki

- (144) Pasture on flat ground  
with largest part of area  
in mixed palatable grasses  
and herbs, with bunches  
of *Imperata* scarcely  
eaten. At foot of volcanic  
hills.

- (145) Rocky hill, mainly grassy  
with principally *Imperata*,  
*Rosa*, etc. Scattered  
*Cycas* on slopes and  
especially near the top.  
The rock is a volcanic  
breccia. Many herbs  
of various sorts in  
grass and between  
rocks.

- (146) almost pure stands of  
*Cycas* on very rocky hills.  
Some *Pipturus*, *Mallotus* etc.  
apparently burned recently  
(dead bushes)

- (147) Hill with mixed  
broad-leaf woods. - *Ficus*  
*retusa*, *F. ~~pubescens~~ <sup>vigata</sup>*, *Hibiscus*  
*tiliaceus*. *Mascaranga*, *Ponteder*  
*Diospyros* in second story.  
*Muhlenbergia* and *Cycas*

- (148) Strip of littoral forest,  
dominantly *Hernandia*, but  
on sea side mostly *Pandanus*,  
with *Scaevola*, *Messerschmidia*,  
*Ponteder* etc.

- Mostly on a dune ridge  
2-3 m. high, but here and  
there projections of undercut limestone  
(149) Hills with scattering of  
bushes in grass and patches  
of almost pure *Cycas*  
on steeper more rocky places.

- (150) Cliffs and bluffs on south  
side covered with thicket,  
more level ground above grassy,  
pastured, in places with  
bunchy *Imperata*.  
(151)



1950 Ryukyu Is.

Taka mari, near  
June 20 - end of Kabira  
Peninsula, back of Ishi-saki  
on knobs of volcanic rock

37635 ~~(det.)~~ *Arizema indica* (L.) O.K.T.  
thickets

36 *Physalis peruviana* L. det. aff.  
among cycads in pasture

37 *Euphorbia*  
*Chamaesyce paranaquensis* (Rostk.) Harms  
grassy pasture

38 *Adiantum pilosa* Ledeb.  
in edge of patch of woods

39 *Panicum*  
*Cymbopogon pectinatus* (L.) A. Camus  
in rocky pasture

40 (creeper) *Melastoma malaccense* (L.) Cogn.  
climbing on rocks

41 (grass) *Bracharia eruciformis* (T.E.)  
in grassy pasture

42 *Trilisa*? *T. trizadate*?  
among rocks in pasture

43 *Hedyotis* *tenelliflora* Bl.  
among rocks in pasture

44 *Leucas*  
among rocks

45 ~~*Lathyrus*~~ *Clinopodium chinense* O.K.T.  
among rocks

46 *Evolvulus alsinoides* L.  
common among rocks

47 *Graphalium japonicum*?  
rare among rocks Thunb.

same - inner edge of littoral forest

48 *Antilema pentandrum* var. *barbatum* Merr.  
rare at

Ishigaki Is.

20 m.

↓ flowers pale greenish yellow

37 flowers white.

38 ~~same~~ flowers yellow.

40 m. 39 Trailing; ~~ripe fruit red~~.

Smuch) *gaster* det. A. Chan.

43 flowers white.

44 flowers white.

30 m. 45 flowers white

↓ 45 flowers rose-purple.

46 flowers bluish

2-3 m.

48 shrub 2 m. tall; fruit  
green, pleasantly acid.



1956 Ryukyu Is.

June 20 - YCAT Compound  
 3 km. n.w. of Ishigaki City  
 weeds in disturbed open ground

37649 *Cenchrus echinatus* L.  
 2 common

2 50 *Euphorbia hirta*  
 common *chan-ayee hirta (L.) Millsp.*

2 51 *Cyperus rotundus* L. *det. J. H. Koenig*  
 small colonies

5 52 (*acanth?*) *Festuca procumbens* var. *horridula* Yamam.  
 common

5 53 *Solanum nigrum* L.  
 common

1-2 m.

det. E. C.  
 Leonard

2 flower lavender pink  
 with 3-lobed purple  
 mark in center of lip.  
 5 erect, flowers white,  
 ripe fruit black.



June 21 - ridge above Ozata  
west of Kara-Lake

(152)  
(Photo  
97814)  
Forest on ridge of schist -  
the lowest parts of  
this are dense and tangled  
and scrubby, perhaps  
are secondary. (60-100 m.)

(153)  
The main part of the  
ridge is in a mixed  
forest that is dominantly  
Ficus of several species  
but has many Lauraceae  
Raphiolepis, Randia, etc.  
Thick undergrowth of  
Arenyza, Psychotria,  
Lasianthus, Alocasia,  
etc. Larcandra, Lauraceae,  
many ferns, lianes  
such as Flagellaria, etc.  
(100-150 m.)

154  
Upward along the ridge (150-180 m.)  
the Ficus becomes less  
dominant but still common.  
Diospyros becomes  
commoner, also Ardisia,  
and many other trees  
come in. A little  
Frezyretia and large  
Aroid vine.  
Some Ilaeocarpaceae, Schefflera,

Lauraceae, thick  
undergrowth of  
Psychotria, Arenyza  
Lauraceae shrubs  
and seedlings, many  
ferns and Centotheca  
on ground.

On next ridge (180-200 m.)  
the Ficus becomes less  
common, but still present.  
Diospyros, Ardisia,  
Lauraceae, Pontederia,  
Glaucarpus, ~~Bischoffia~~  
Styrax, Mallotus philippinensis  
some Garcinia. One  
Dendropanax seen, small.  
Some secondary species - e.g.  
Macaranga, Mallotus,  
Bischoffia, etc. probably  
the result of the intensive  
logging that is obvious  
here.

Ferns cover the ground  
under a loose shrub  
layer of Psychotria,  
Lasianthus, etc.  
Tectaria most abundant.  
Some Asplenium nidus  
in trees. Aroids climbing  
in trees - perhaps Epipremnum.



(156) Here on a long <sup>(200 m.)</sup> more or less level ridge *Quercus* comes in in considerable numbers. Some *Elaeocarpus*, *Dendropanax*, much *Andisia*, *Diospyros*, many *Lauraceae*. Ferns abundant. Some *Freyinetia*.

(photo  
950-110)

On ridge the forest is about 10-12 (-15) m. tall, a few trees to 2.5-3 dm. mostly 10-20 cm., some larger *Ficus*.

Undergrowth rather thin - *Psychotria*, *Antidesma*, *Cunila*, many ferns.

Ntana Yama,  
June 21 - ridge above Ozato,  
~~west of Kanda Lake~~

in degraded, tangled forest, dominantly *Ficus* ~~*Smilax*~~ *Heterosmilax japonica* Kunth.  
det. T. Koyama 1957

37654

5

5

55

occasional  
*Xanthoxylum* <sup>*Fagaria ussuriensis* (Champ.) Engelm. (= *Zanthoxylum ussuriensis* (Champ.)</sup>  
occasional

2

56

*Tubocapsicum?*

rare along trail

5

57

~~*Centotheca aspera*~~

common locally *Elantherus vicius*

3

58

*Arenga tremula* (Blanco) Becc.

common in undergrowth

*A. longifolia* Becc. det. H. B. Hall

100-150 m.

vine climbing in trees,  
fruit immature.

5 small tree, tangled  
in mass of vegetation,  
fruits green.

5 branched herb, 0.8 m. tall,  
fruit bright red, soft.

5 prostrate to ascending

(F. M. Bailey) Merr.

OR 16 several stems from base  
inflorescence reaching  
about 2 m. high, leaves 3-4,  
stem ~~not~~ covered by  
sheathing leaf bases.



same - in mixed broad-leaf  
evergreen forest on broad  
ridge top.

37659 *Flagellaria indica* L.  
common generally

2 60 *Diospyros* ~~*indica*~~ *indica* Bl.  
common generally

5 61 *Smilax* ~~*heterophylla*~~ *heterophylla* Kunth  
det. T. Koyama 1959  
common

5 62 *Citrus* ~~*depressa*~~ *depressa* Hayata  
occasional in understory

5 63 (orchid) *Calanthe pinnatifida* Schl.  
occasional, terrestrial

2 64 *Carnellia* ~~*japonica*~~ *japonica* (var. *maconensis* Hayata?)  
occasional

5 65 *Ficus* ~~*ampelae*~~ *ampelae* Burmf.  
occasional

5 66 *Ophiorhiza* ~~*liukiuensis*~~ *liukiuensis* Hayata  
common locally

2 67 (orchid) *Hetaeria oblongifolia* Bl.  
rare, terrestrial, det. L.A. Garay

5 68 *Neolitsea* ~~*locusta*~~ *locusta* (Hance) DC.  
occasional

3 69 ~~*Stemodia*~~ *Stemodia subglabrata* (Hance) Ching  
common

same - in montane forest,  
with much *Quercus*

5 70 *Antidesma* ~~*japonicum*~~ *japonicum* Sieb.  
common in undergrowth

5 71 *Ficus retusa* var. *retusa* (Thunb.) King  
occasional

150-200m.

69 tangled vine climbing  
into tree-tops; fruit immature.

60 small tree, fruit dull  
brownish orange

61 vine climbing in trees,  
fruit immature.

62 small tree 4 m. tall,  
fruit immature, aromatic.

63 in small clumps,  
flowers white

64 small tree; fruit immature.

65 large spreading tree  
with single, somewhat  
buttressed trunk,  
no aerial roots, yellow fruit.

66 suffrutescent, 4 dm. tall,  
flowers white.

67 stems twisting,  
flowers minute, bronged.

68 small tree; fruit immature

200-225m.

70 shrub 1 m. tall, fruit  
immature

71 large spreading tree  
with complex trunk



1954

- 37672 *Ardisia* <sup>quinquegona Bl.</sup>  
 3 common  
 3 73 *Vittaria* <sup>elongata Swartz</sup>  
 epiphytic  
 5 74 *Nephrolepis* <sup>biserrata (Swartz) Schott</sup>  
 epiphytic, ~~fronds pendent~~  
 6 75 *Ardisia* <sup>ziboldii Miq.</sup>  
 common

June 22 - ~~near~~ Banna Lake

(157)  
 (photo  
 940-10) n.w. base. Pine wood. fairly  
 good stand on gently  
 sloping terrace - trees up  
 to 20m tall and 2-3 dm. dbh.  
 spaced 3-5 m.

Very few shrubs beneath,  
 sparse stand of *Miscanthus*  
 some *Paspalum conjugatum*  
 with *Elephantopus scollis*.  
 Has been somewhat  
 pastured.

(158) On lower slopes a tangled  
 scrubby mass of *Mallotus*  
~~glabrus~~ *Wendlandia*, *Schinus*  
 and other secondary shrubs  
 with *Miscanthus*.  
 A little pine and *Acacia*.

shrub 2 m. tall

74 fronds pendent

75 small tree 4 m. tall,  
 branches disarticulating.

(159)

upper slopes and  
 summit are covered  
 by a low scrubby  
 very dense wood  
 of trees 3-5 m. tall  
 mostly things such  
 as *Quercus*, *Ilex*, *Diospyros*,  
*Elaeocarpus*, ~~etc.~~ etc.  
 with rather small  
 coriaceous leaves.

(160)

On the inner side  
 of the rather V shaped  
 series of ridges  
 larger trees seen  
 more abundant on  
 the mid-slopes and  
 tree ferns are common  
 in ravines.



On the main ridge  
the low forest is very  
dense, 4-5 m. tall. *Quercus*  
is common, also *Camelia*,  
*Ardisia tabernaemontani*, *Trema*,  
*Mallotus*, *Macaranga*,  
*Diospyros*, *Dendropanax*,  
*Ilex*, *Ficus* 3 spp. *Rhus*,  
*Wendlandia*, *Phyllanthus*,  
*Eugenia*, *Psychotria*,  
*Cinnamomum*, *Euscaptia*,  
*Antidesma*, *Styrax*, *Larandra*.

The stems are mostly  
2-5 cm. d.b.h. a few much  
larger, these mostly *Quercus*.  
The spacing is mostly  
0.5-1 m.

On the ground are  
scattered ferns (*Polystichum*)  
etc., tufts of sedge (*Scleria*?)  
and *Carex* alpinia.

Some *Freyinetia* in saddle.  
also much *Colysis*.  
*Yamagii*, brown with dark  
bands, or *Ardisia*.

Continue trail around  
to east from beyond  
saddle - on steeper  
slopes the vegetation  
does not differ much  
from on ridge, except  
that stature may be  
a little greater and ferns  
(*Colysis*) locally more  
abundant.

This trail leads  
around to what almost  
amounts to a terrace -  
an area of very gentle  
slope. Here the trees  
are taller, up to 10 or more  
m. and more widely  
spaced. Composition  
does not differ conspicuously.  
More *Ficus* here but  
not dominant. *Quercus*  
still common. Ferns  
common but not abundant.

Another trail from  
bottom of saddle around  
to west and south  
through essentially  
similar vegetation  
to that on ridge, on steep  
slope. Down somewhat  
the stature is some higher.  
*Ardisia* more common.



Two Yamagi seen on Smilax. These were brighter brown than usual and decorated with 2 rows of yellow and black points. The two transverse ~~rows~~ of bands of black hair on antenae are hidden when animal is quiet, asserted when excited. Crawled off Smilax onto trunk of *Cinnamomum doederleinii*.

Koya Yama  
June 22 - Pass west of Banna-lake

in low coppice-like wood

- 37676 *Dianella ensifolia* (L.) DC.  
5 common on walls of road cut on ~~schist~~ weathered schist.
- 5 77 *Stephanis japonica* (Thunb.) Miao  
edge of wood
- 6 78 *Bridelia ovata* Decasne  
occasional
- 6 79 *Vaccinium hirtellum* A. Gray  
occasional
- 6 80 *Alnus formosana* (Bursk.) Makino  
common, especially in lower moist spots
- 5 81 *Vitex trifolia* L.  
on wall of road cut

In Pass, on west side, is a coppice-like growth of *Quercus*, *Hamamelis*, *Schima*, *Alnus*, *Myrsine* (?), *Laurus*, etc.

about 3-4 m. tall, all apparently clumps of stump sprouts.

50 m.

OK. flowers light blue, ripe fruit bluish purple.

77 vine twining in trees; fruit red.

78 small tree 4 m. tall, fruit green.

79 slender shrub 2.5 m. tall; fruit immature

80 small tree

OK. shrub 1 m. tall, flowers deep lavender to violet.



1954 Ryukyu Is

Tsukunatsaki,

June 22 - s.w. base of  
Bana-lake37682 *Jussiaea* ~~diffusa~~ L.  
roadsideMuibaga,  
June 22 - s.w. ridge  
of Banna-lake  
roadsides in scrubby  
woods.5 83 *Isleria* ~~terrestris~~ (L.) Fernald  
common in deep grass8 84 *Smilax* ~~obovata~~ (Miq.) Del. T. Bryson  
occasional 19546 85  
occasional in pine woods86 *Glochidion*  
commonTaramani,  
June 22 - Banna-lake,  
in ~~scrubby~~ scrubby woods near  
summit2 87 *Machilus* ~~thunbergii~~ S. & Z.  
rare5 88 *Ficus* ~~erecta~~ var. *beudanticana* (H. & B.) King  
occasional5 89 *Osmanthus* ~~bracteatus~~ Maxim.  
occasional5 90 *Osmanthus* ~~bracteatus~~ Maxim.  
occasionalFarber 37685 is  
*Daphne phyllo-glaucens*  
ssp. *teijsmannii* (Zoll.)  
Huang  
Det. E. H. Walther  
Det. H. S. GentryYours might  
be the  
record this  
for your  
notebook.

I haven't determined the name yet

white



You might  
want to  
record this  
in your

notebook.

I haven't determined the var. yet

Fosberg 37685 is  
*Daphniphyllum glaucescens*  
ssp. *teijsmannii* (Zoll.)

Huang

Det. E. H. Walpole

Det. E. H. Walpole



Ch'ien, Ch'ung-shu; Wu, Ch'ang-i, <sup>and</sup> Ch'ien, Ch'ang-t'u.

1956

The vegetation types of

China. Act. Geogr. Sin. 22: 37-92.

In Chinese, with English summary; describes 12 forest, steppe, meadow and desert types.



1956 Ryukyu Is

Tsuburatsaki,

June 22 - s.w. base of  
Bana-dake37682 *Jussiaea* *suffruticosa* L.  
roadsideMuibaga,  
June 22 - s.w. ridge  
of Banna-dake  
roadside in scrubby  
woods.5 83 *Iscleria* *terrestris* (L.) Fernald  
common in deep grass8 84 *Smilax* *obovata* Thunb. det F. L. S. 1954  
occasional6 85  
occasional in pine woods86 *Glochidion*  
commonTaramani,  
June 22 - Banna-dake,  
in scrubby woods near  
summit2 87 *Melastoma* *thunbergii* S. & Z.  
rare5 88 *Ficus* *crataeva* var. *beachiana* (H. & A.) King  
occasional5 89 *Osmanthus* *fragrans* Maxim.  
occasional5 90 *Osmanthus* *fragrans* Maxim.  
occasional

80 m.

Much branched herb  
1.5 m. tall, petals  
yellow, emarginate, 1 cm. long.

180 m.

49 forming tangle; fruit  
yellow-green, probably  
nearly mature.85 small tree, fruit  
immature.86 shrub 3 m. tall;  
flowers yellow.

220 m.

87 shrub 2 m. tall  
inflorescences red, fruit dark green.88 shrub 2 m. tall,  
figs greenish.89 small tree, flowers  
pale yellowish green.  
fragrant with a sourish  
sweet odor.90 small tree; flowers  
white



- 37691 *Ilex wachnagii* Loes.  
occasional
- 5  
1 92 *Parrotia?*  
rare *Taranea*
- 2 93 *Morinda umbellata* L.  
rare
- 5 94 *Ilex maximowicziana* Loes., det aff.  
occasional
- 6 95 *Psidium acuta* Decaisne  
rare
- 6 96 *Premna obtusifolia* R. Br.  
occasional

June 22 - north ridge  
of ~~Bassano Lake~~ Taramani  
in <sup>low</sup> scrubby dense moist  
forest

- 6 97 *Ardisia*  
common
- 98 *Rhus succedanea* L.  
common

- small tree, fruit immature.
- 92 shrub; buds white.
- 93 vine, climbing in trees.
- 94 small tree; fruit  
immature.
- 95 small tree; fruit  
immature.
- OK 96 small tree, aromatic  
when broken; flowers  
pale green.

200 m.

- slender shrub 2m.  
tall; fruit immature.
- 97 small tree, leaves  
tending to turn red;  
fruit green.



June 23 - ~~marsh lake~~  
steep slope (45°+) of chert  
covered by a mixture  
of grass and low brush.  
The grass is a mixture  
of *Imperata*, small  
*Andropogon* (?), *Paspalum*,  
etc. *Sporobolus elongatus*.

(161)

(photo  
940-7 fm  
#161-167)

Bushes are

a *Osbeckia* o *Psidium*  
o *Rhodomyrtus* o *Symplocos*

p.c. *Eurya* spp.

c *Ficus* 3 spp.

la, c *Pinus* (seedlings)

o *Glochidion*

o *Mallotus*

much *Nephrolepis exaltata*

c *Dianella ensifolia*

f *Elephantopus scultus*

f *Eupatorium* sp.

f, la *Lygodium*

some c *Rubus* (small sp.)

~ *Bidens pilosa*

~ *Commelina*

~ *Adiantum* sp.

c la *Thelypteris* sp.

~ *Wahlenbergia*

~ *Fimbristylis*

~ *Emilia sonchifolia*

c *Melast.* or *Lyth.*

o *Lepidocarya cuneata*

Some colonies of *Gleichenia*  
*linearis* on steep places.

(162)

Toward the top of the  
ridge *Symplocos*  
becomes abundant and  
very near the top *Vaccinium*  
appears in some number.  
*Thelypteris* is very  
abundant at the top,  
some *Andropogon*, much  
*Eupatorium*.

*Miscanthus* is scattered  
on top, especially in  
edges of brush.

(163)

The east slope is  
densely brush-covered,  
the brush coming up  
to a sharp line at the  
crest. A few larger  
pines on the ~~so~~ crest, many  
saplings locally.

The scrub on the north  
slope is mixed in compo-  
sition:

*Raphiolepis*

*Eurya*

*Vaccinium*

*Mallotus*

*Symplocos*

*Distylium* etc.

*Celastr.*

*Dendropanax*

*Eugenia*

*Pittosporum*

*Randia*

*Ardisia*

*Ilex*

*Ficus* 2 spp.

*Psychotria*

*Wendlandia*



This scrub is a dwarf forest about 3-4 m. tall, of erect slender stems mostly under 2 cm. thick, some larger, mostly in clumps as though ~~the~~ groups of stump sprouts. A very few shrubs - Psychotria. Sparse ground cover of ferns (*Polystichum*, *Pteris*, etc.) and seedlings. Small *Asplenium nidus* on chert boulders.

Some vines - *Asclepiads*, *Smilax*.

Scattered tufts of a broad leaved grass, sterile.

(164)

Slopes below summit <sup>on</sup> west side are thickly covered by a mixture of *Miscanthus* and such shrubs as *Eurya*, *Rhus*, *Ficus*, *Symplocos*, *Psidium* and seedling pines, with a few scattered larger pines. Much *Smilax* and several other vines.

(165)

*Pandanus* in tangled scrub in shallow ravine on west slope almost to top of ridge at saddle.

(166)

At the foot of the hill is a band of dense *Acacia confusa* with chimbs filled by *Miscanthus*. Very little undergrowth or ground cover, but some *Smilax* vines.

(167)

Below this, on flattish ground, just above the paddy fields is a solid stand of *Paspalum conjugatum*.



This scrub is a dwarf forest, about 3-4 m. tall, of erect slender stems mostly under 1 cm. thick, some larger, mostly in clumps as though bunches of stump sprouts.

~~Almos~~ Ground layer very sparse - scattered ferns (*Polystichum*, etc.) and seedlings.

June 23 - Marake Lake, summit ridge

in open brush and grass

- 37699 *Canavalia microcarpa*  
rare, climbing in bushes
- 37700 *Aeginetia indica* L.  
rare on open bits of soil

- 2 01 *Hypericum japonicum* Thunb.  
very local in thin place in grass

- 2 02 (~~st.~~) *Fagopyrum nitida* Presl (= *Zanthoxylum nitidum*)  
common locally

- 2 03 (~~pass~~) *Saccolipia indica* (L.) Chase  
occasional

83

185 m

- vine; flowers rose pink, pods somewhat inflated.
- 04 700 leafless, from mass of fleshy roots on the bottom of a thickened stem or corm; stem ~~long~~ and spathe bronze, striped with purple, corolla white, slightly purplish toward base, lobes deep purple.
- 01 erect, flowers orange-yellow.

- 02 scandent shrub; fruits somewhat immature, aromatic when crushed.

det. A. Chase



June 23 - same - in  
edges of dwarf forest

37704

5

~~Asclepias~~ *Asclepias affinis* (H. & A.) Thunb.  
climbing in trees

5

05

*Eurycoma lanata* Maxim.  
common

2

06

*Randia olavetta* Turrill  
rare

5

07

*Vincetoxicum* *cyaneum* *bicolor* *Walt.*  
common, climbing in trees

June 23 - Massiatake,  
south slopes

5

08

*Mussaenda* *parviflora* Miq.  
in acacia thicket

c

09

*Rhodomyrtus tomentosa*  
occasional on slope

5

10

*Eupatorium* *parviflorum* *Walt.*  
common *quasi-tripartitum* (H. & A.)  
*quasi-tripartitum*

180 m.

woody vine.

5

shrub 2 m. tall; fruit  
immature.

6

shrub 1.5 m. tall, flowers  
white.

7

vine; petals maroon,  
bronze in center of lobes,  
corolla white.

100 m.

scandent shrub,  
twining in shrubs,  
flowers yellow;  
fruit immature.

140 m.

shrub 1 m. tall

150 m.

Kishan.

erect suffrutescent  
herb; flowers, pale lavender,  
honey-scented.



May 24.

Schist outcrops in  
 Imperata pasture.  
 Andropogon 2 spp.  
 Liliun longiflorum  
 Lespedeza cuneata  
 Borreria  
 Oxalis corniculata  
 Setaria  
 Wahlenbergia  
 Artemisia  
 Rubus  
 Lygodium  
 Lactuca  
 Psidium  
 Gentella  
 Phaseolus  
 Uraria  
 Gynura  
 Cyperus 2 spp.  
 Panicum  
 Fimbristylis.  
 Imperata  
 Emilia sonchifolia  
 Ficus erecta  
 Ficus retusa  
 Morus  
 Carmona

May 24 - Tozota

patches of Eocene  
 and post Miocene  
 limestone covered by  
 a bushy forest of  
 Pipturus, Ficus  
 Macaranga, Clerodendrum,  
 Melia, Murraya,  
 with Alocasia  
 around edges.  
 Cultivated patches  
 of beach deposit soil  
 (Lhiya?) - sugar  
 cane, sweet potatoes,  
 sesame, etc.



1956 Ryukyu Is.  
back of Hoshima,  
June 24 - Tozato Distr.

- 37711 *Sesamum indicum* L.  
5 cultivated on limestone soil  
6 12 *Pipturus arborescens* (Link) C.B. Rob.  
important part of vegetation  
on limestone  
5 13 *Pipturus arborescens* (Link) C.B. Rob.  
important part of vegetation  
on limestone  
5 14 *Boehmeria nivea* (L.) Rottb.  
on rough limestone  
5 15 *Amaranthus* <sup>8. m. p. m. n. v. e. a. l. m. c. o. n. s. e. n. s. i. s.</sup> ~~quadrifidus~~ Desv.  
weed in edges of cultivated  
fields.

~~June 24~~  
June 24 - 2 km 25° W. of m. of  
mouth of Todoroki-gawa  
in small desiccating  
fallow rice field

- 5 16 *Fimbristylis* <sup>8. m. p. m. n. v. e. a. l. m. c. o. n. s. e. n. s. i. s.</sup> ~~dichotoma~~ (L.) Vahl  
common  
5 17 *Cyperus* <sup>8. m. p. m. n. v. e. a. l. m. c. o. n. s. e. n. s. i. s.</sup> ~~haspan~~ L.  
common  
2 18 *Limnophila* <sup>8. m. p. m. n. v. e. a. l. m. c. o. n. s. e. n. s. i. s.</sup> ~~antipoda~~ (L.) Merr.  
occasional  
19 *Hypericum* <sup>8. m. p. m. n. v. e. a. l. m. c. o. n. s. e. n. s. i. s.</sup> ~~japonicum~~ Thunb. (= *Saundersia japonica* (Thunb.) Y. K.amura)  
common

(over)

40 m.

- erect, flowers white,  
turning faintly lavender.  
shrub 3 m. tall,  
flowers green, fruit  
with white fleshy  
receptacle, nutlets  
borne in pits, not adnate  
to receptacle.  
shrub  
bush 1.5 m. tall,  
sprawling.

50 m.  
↓  
Morigama Distr.

OK J.H. W. 6m.

- 17 caespitose, stems soft,  
light green.

- erect, flowers deep yellow  
Y. K.amura



June 24 - same -  
on schist exposures in  
grassy pasture

3770 *Andropogon*  
occasional *Andropogon* (Pursh) C.

2 21 *Scleria* *Scleria* (L.) S. *halimifolia* (Nees)  
rare

2 22 *Fimbristylis* *dictyonema* (L.) Vahl  
rare

1 23 *Euphorbia* *parviflora* (L.) Hara  
occasional

2 24 *Mikania* *undulata* (L.) Desv.  
occasional

1 25 *Bomarea* *hydnoides* (L.)  
rare

2 26 *Panicum* *capillare* (L.) E. Smith  
common

50m.

↓

in A. class  
*Portulaca* (L.) A. class, but very distinct. *Trifolium*  
leaf, abnormal.

23 erect, flowers white.

24 flowers white

50m.

in A. class  
A. class



196

197









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2. 500 ft. contour  
3. 200 ft. contour  
4. 100 ft. contour  
5. 50 ft. contour  
6. 20 ft. contour  
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8. 5 ft. contour  
9. 2 ft. contour  
10. 1 ft. contour  
11. 0.5 ft. contour  
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13. 0.1 ft. contour  
14. 0.05 ft. contour  
15. 0.02 ft. contour  
16. 0.01 ft. contour  
17. 0.005 ft. contour  
18. 0.002 ft. contour  
19. 0.001 ft. contour  
20. 0.0005 ft. contour  
21. 0.0002 ft. contour  
22. 0.0001 ft. contour  
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25. 0.00001 ft. contour  
26. 0.000005 ft. contour  
27. 0.000002 ft. contour  
28. 0.000001 ft. contour  
29. 0.0000005 ft. contour  
30. 0.0000002 ft. contour  
31. 0.0000001 ft. contour  
32. 0.00000005 ft. contour  
33. 0.00000002 ft. contour  
34. 0.00000001 ft. contour  
35. 0.000000005 ft. contour  
36. 0.000000002 ft. contour  
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99. 0.000000000000000000000000000002 ft. contour  
100. 0.000000000000000000000000000001 ft. contour

2 3 Miles

4000 Meters

4000 Yards

CONTOURS

UNIVERSAL SPHEROID

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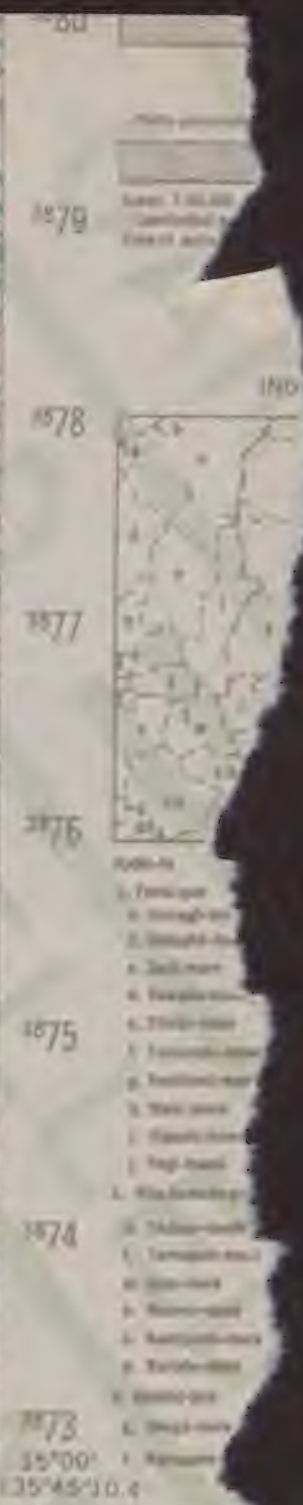
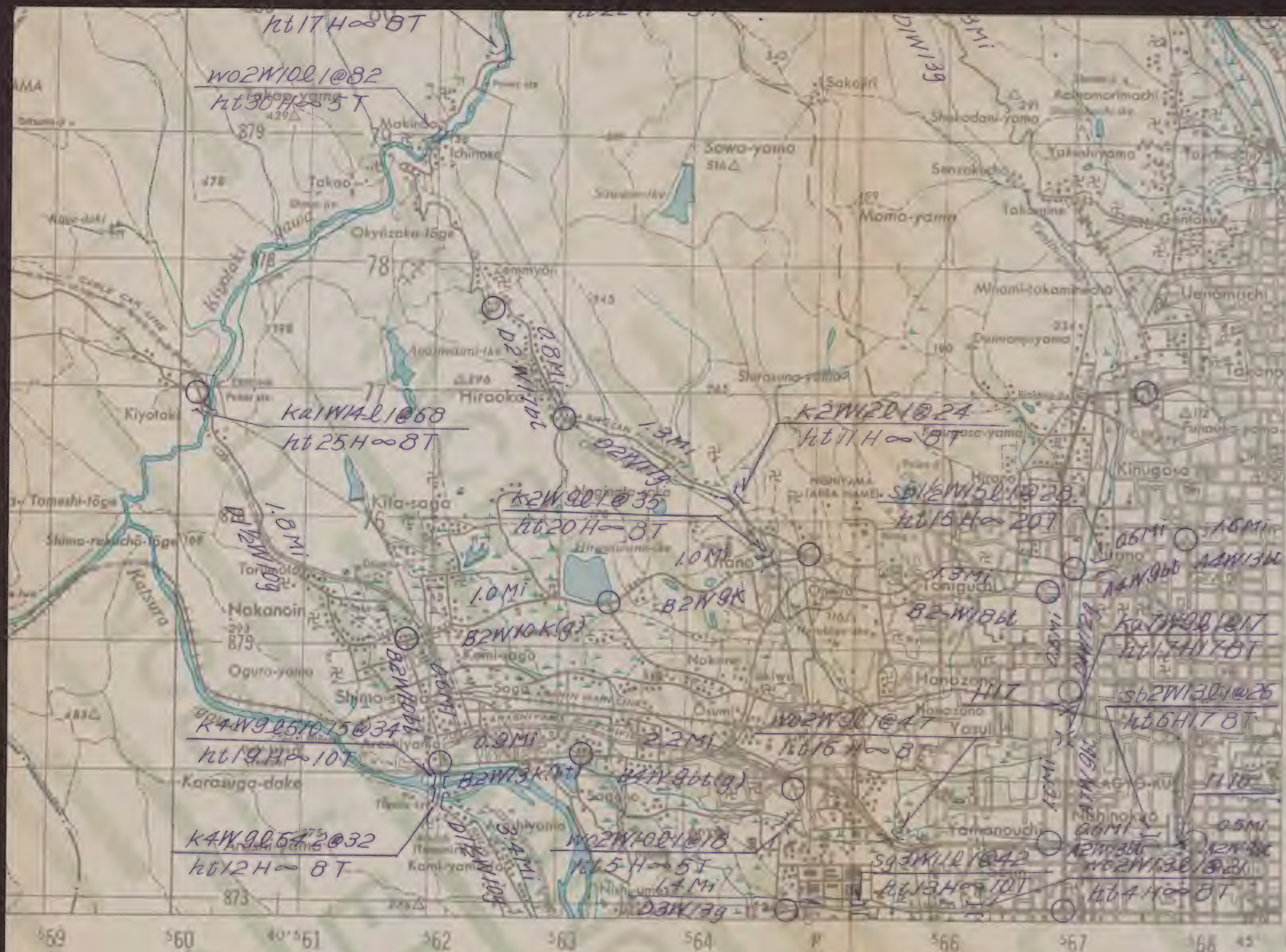


28 June 1956 AM

Eocene Limestone!

*Mallotus moluccanus*, *Ficus erecta*, *F. superba* var. *japonica*,  
*F. "ribbed fruit"*; *Alocasia cucullata*; *Smilax* sp.; *Morus australis*,  
*Garcinia spicata*; *Bischofia javanica*; *Stictocardia*  
*elaeagnifolia*; *Macaranga tanarius*; *Mallotus moluccanus*,  
*Braussonetia papyrifera*; *Rhus succedanea*; *Ardisia*  
*sieboldii*; *Microlepia* sp; *Arenga engleri*, *Fagaria indica*?,  
*Diospyros maritima*; *Smilax*; *Murraya paniculata*,  
*Peperomia* sp. *Rhaphis* *liukiuensis*, *Premna obtusifolia*,  
*Hernandia peltata*, *Echeita ehyrisiflora*, *Asplenium nidus*,  
*Ptilosporum tobira*; *Calliandra japonica*, *Hoya carnosa*,





64TH ENGR BASE TOPO BN BN 2573 K4-2/52-3 W

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TER UNIVERSAL  
EL SPHEROID

UNITED STATES DESIGNATION  
512

TO GIVE A STANDARD REFERENCE ON  
THE SHEET TO NEAREST 100 METERS



28 June 1956

Afternoon.

Eocene Limestone:

*Mallothus paniculatus*; *M. moluccanus*;  
*Pisonia umbellifera*; *Ficus erecta*; *F. superba* var. *japonica*;  
*F. retusa* var. *brida*; *F.* "ribbed fruit"; *Smilax* sp.;  
*Alocasia cucullata*; *Colocasia* sp.; *Monstera deliciosa*;  
*Diospyros morrisiana*; *D. japonica*; *Hoya carnosae*;  
*Arenga engleri*; *Pteris* sp.; *Asplenium* sp.; *Asplenium*  
*ridus* (*Neottopteris ridus*); *Nephrolepis cordifolia*;  
*Lycopodium scandens* var. *microphyllum*; *L. flexuosum*;  
*Piper* sp.; *Peperomia japonica*; *Fagaria indica* (?);  
*Pittosporum tobira*; *Psychotria serpens*; *Glycosmis pentaphylla*;  
*Tourattia japonica* (not in flora Obiwanu); *Callicarpa japonica*;  
*Zanthoxylum armottianum*; *Toddalia asiatica*;  
*Murraya paniculata*; *Fraxinus griffithii*; *Breynia rhamnoides*;  
*Sapium* sp.; *Phyllanthus* sp.; *Morus australis*; *Hibiscus*  
*eliaceus*; *Boerhaavia* sp.; *Rhus succedenae*; *Carmona retusa*;  
*Paeraria tonkinensis*; *Quercus nuyagii*; *Cudrania cochinchinensis*.



*Callicarpa dichotoma* (Lour.) K. Koch  
38552

---

*C. iniomotensis* Masam. 37191,  
37289

---

*C. japonica* Thunb.  
38407, 38315, 38546, 38180.

---

*C. japonica* var. *luxurians* Rehd.  
37869, 38067, 38298,  
37763, 37857, 37066

det. Moldenke

H.N.



Determinations by E. H. Walker,  
Book 45

- obscure make slips*
- (4) ✓ 37028 *Securinega flueggeoides* M.-A.
  - ✓ 37160 *Sarcandra glabra* (Thunb.) Nakai
  - ✓ 37192 *Gymonosphaera podophylla* (Hook.) Copel. det C. V. Morton
  - ~~372~~
  - ✓ 37211 *Castanopsis* ~~sp.~~ *cuspidata* (Thunb.) Schott
  - ✓ 37225 *Sarcandra glabra* (Thunb.) Nakai
  - ✓ 37256 *Alchornea trewioides* M.-A. (var. *formosana* Pax?) (not *Mallotus* as previously reported).

- obscure annotated*
- (1) ← 36976 *Spiranthes stylitis* Zoll.
  - "(U)" ← 36994 *Tarenna gyokushinkwa* Ohwi (not *Randia cochinchinensis*)
  - ✓ 37011 *Smilax* (*Heterosmilax*?)
  - ✓ 37019 *Canavalia* sp.
  - ✓ 37170 *Spathoglottis* <sup>l</sup>*picata* Bl.
  - ✓ 37239 *Calanthe fauriei* Schl.
  - ~~37285 *Stereosandra javanica* Bl. det. L. A. Garay~~

- add a label make slips*
- ✓ 36990 *Lygodium microstachyum* var. *glabrescens* Nakai
  - ✓ 37071 " "
  - ✓ 37148 *Ficus benguetensis* Merr.
  - ✓ 37214 *Elaeocarpus sylvestris* var. *ellipticus* (Thunb.) Hara

- ✓ 38050 *Neolitsea ohbana* Koidz. det. C. K. Allen
- ✓ 37822a *Eleocharis ochrostachys* Steud. det. H. K. Svenson







